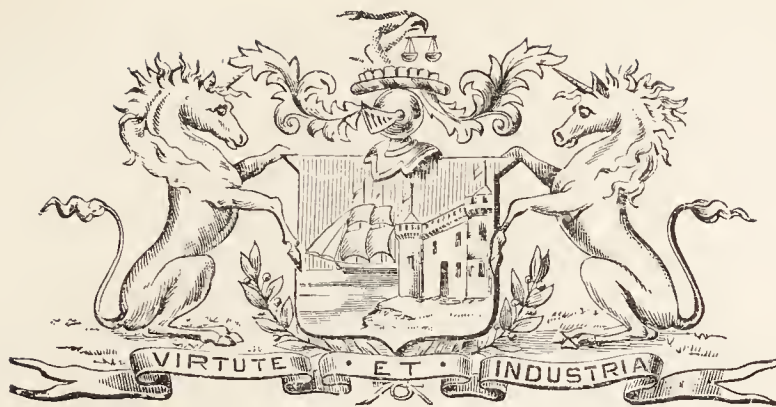


1898.



CITY AND COUNTY OF BRISTOL

ANNUAL REPORT

OF THE

Medical Officer of Health.

—:O:—

Printed by order of the Health Committee.

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BRISTOL :

BENNETT BROTHERS, LD., PRINTERS, COUNTERSLIP

1899.



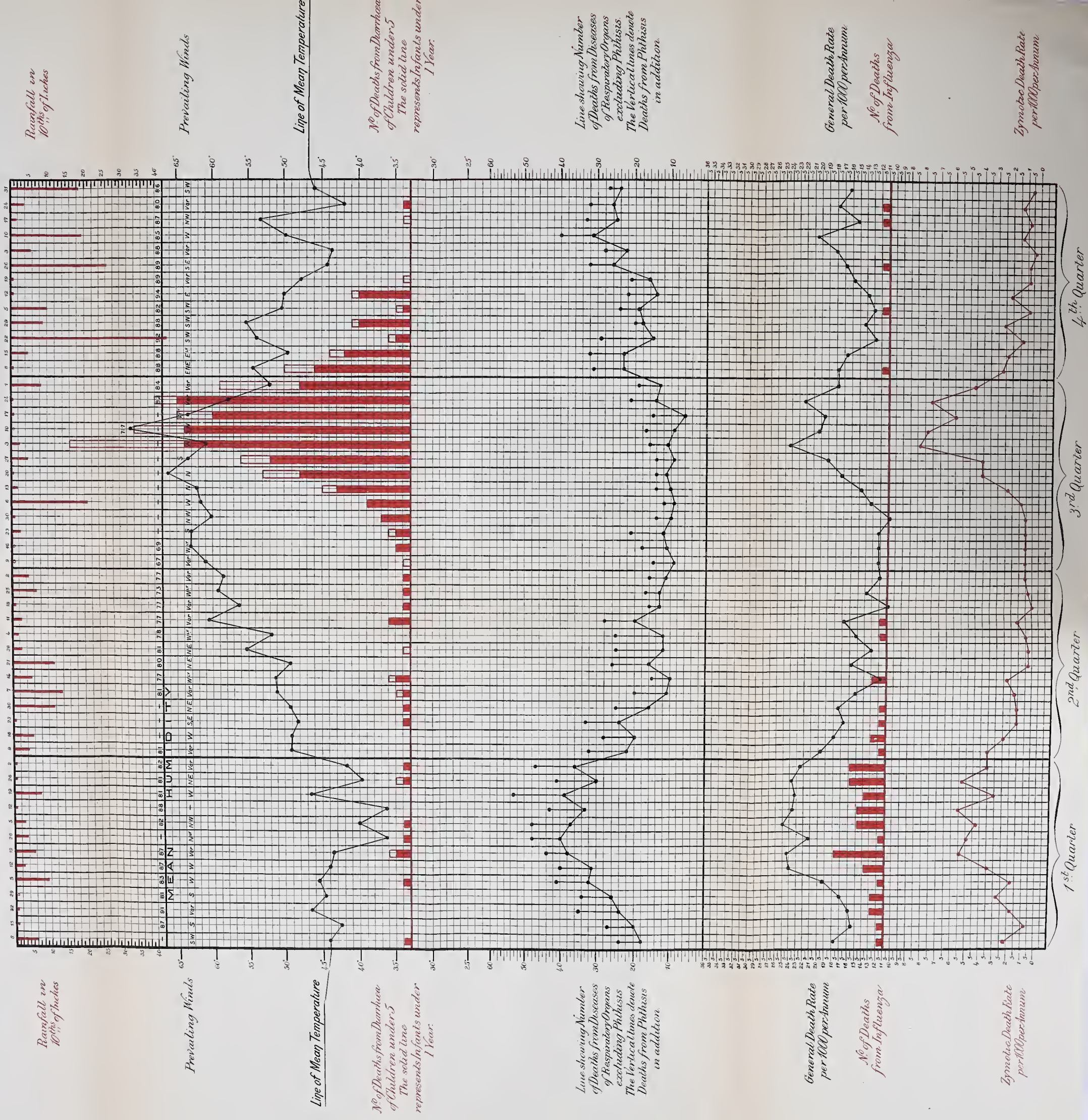
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Chart

Showing Mean Temperature, Rainfall, relative Humidity, (saturation = 100) prevailing Winds, also Number of Deaths returned from Diseases of Respiratory Organs excluding Phthisis from Diarrhoea and from Influenza, the General Death Rate and the Zymotic Death Rate in the Bristol Sanitary District for each Week of the Year 1898.

Week Ending January February March April May June July August September October November December



HEALTH COMMITTEE.

1898-1899.

The Lord Mayor :

The Right Hon. Councillor HERBERT ASHMAN.

Chairman :

Alderman COPE-PROCTOR.

Deputy-Chairman :

Councillor F. GILMORE BARNETT.

Alderman HALL.

„ THATCHER.

„ WATHEN.

Councillor HENRY ANSTEY.

„ T. J. COE.

„ JOHN COOLE.

„ H. F. COTTERELL.

Councillor A. J. HARRIS.

„ WM. JENNINGS.

„ FRANK MOORE.

„ CHAS. NEWTH.

„ SAML. SHIRLEY.

„ COLSTON WINTLE.

CITY OF BRISTOL.

MEDICAL OFFICER OF HEALTH'S DEPARTMENT, 1898.

Medical Officer of Health : D. S. DAVIES, M.D., D.P.H.
Deputy-Medical Officer of Health : J. C. HEAVEN, L.R.C.P., D.P.H.
Medical Attendant at Isolation Hospitals :
G. C. PAULI, M.R.C.S.
Chief Clerk : E. W. HARRIS.
Clerk : R. R. WARREN.
Junior Clerk : W. N. BROWN.

Laboratory Assistant : E. M. HORLER.

Chief Inspector : J. W. KIRLEY.
Superintendent Inspector : ‡*T. LOWTHER.

<i>District Inspectors (11) :</i>					
	District.			District.	
H. CALCUTT	(Central)	5	*†F. R. SLADE	(St. Paul)	4
G. E. BUSH	(Bedminster)	7	*†A. E. KING	(Knowle)	8
*H. HASELL	(Horfield)	2	*†H. C. LEAT	(S. Geo. W.)	10
*J. WILKINSON	(Clifton)	1	*T. J. CROFTS	(Easton)	6
*H. J. KIRLEY	(Cotham)	3	*F. KIRLEY	(S. George E.)	11
*J. T. LYONS	(Stapleton)	9			

Inspector of Common Lodging Houses and Bakehouses.

*S. O. DIMOND.

Inspector of Dairies, Cowsheds and Milkshops :

*†E. J. CASELY.

Inspectors of Slaughter Houses, Meat and Fish :

S. THOMAS. | *A. GITSHAM.

Inspectors of Workshops :

*A. W. GRIFFITHS. | *W. J. WREFORD.

PORT OF BRISTOL.

Port Medical Officer of Health : D. S. DAVIES, M.D., D.P.H.
Assistant Port M.O.H. : J. C. HEAVEN, M.R.C.S., D.P.H.
Chief Inspector : S. DIMOND.
Port Inspector : A. DICKENS.
Assistant Port Inspector and Boatman : J. REX.
Master of "Luath" : S.G. JACKSON.

‡ Surveyor's Certificate Sanitary Institute.
* Inspector's Certificate Sanitary Institute.
† Registered Plumbers.
‡ Certificated Pilot for Bristol Channel.

REPORT.

PART 1.

POPULATION, ACREAGE, AND GENERAL SANITARY CONDITION.

During the year 1898, partly as a result of the Bristol Extension Act, 1897, and partly for Registration purposes, considerable alterations have taken place in the areas of the Registration Sub-Districts into which the old City was divided, and in the grouping and arrangement of the New Districts. Thus the old Registration Sub-District of Castle Precincts, with a considerable portion of S. Paull has during the year been merged in S. Mary Redcliff; and that of S. James is now included in S. Augustine. Previously, also, in 1897, that portion of the Registration Sub-District of Westbury that was within the Municipal area was attached to Clifton, to which Avonmouth had been already added by the Extension Act of 1895*

As a result of extension also, that portion of the Urban Sanitary District of Horfield which came into the City was added to the portion of the Ashley Registration Sub-District already within the City.

S. George and Stapleton were also brought in from the County, and retained their limits and names.

Bedminster has also, for purposes of the 1898 statistics, been taken to include the parts of the Somerset Districts added by the Extension Act of 1897, in addition to the old Urban District of Bedminster. These have recently (January, 1899) been re-divided into the two Urban Registration Sub-Districts of Bedminster and Knowle.

* Avonmouth is now (January, 1899) no longer included in the Registration Sub-district of Clifton, but has been added to Ashley.

Under these circumstances of amalgamation and change, it is difficult to present Table **A** in its complete form, and, indeed, this will remain imperfect till the forth-coming Census of 1901 puts registration facts and figures once more upon an accurate basis.

Table A.
Showing Population, Acreage, and Number of Persons per Acre (Density) in each of the Registration Sub-Districts of Bristol for 1891 and 1898.

Registration Sub-Districts, 1891.	Acreage.	Popula- tion middle of 1891.	Density, 1891.	Registration Sub-District, 1898.	† Acreage	Popula- tion middle of 1898.	Density, 1898.
S. Mary Redcliff ...	170	9,287	54·6	S. Mary Redcliff ..	324	16,000	49·3
Castle Precincts ...	119	5,558	46·7	(Including Castle Precincts and part of S. Paul.)			
S. Paul	148	19,046	128·6	S. Paul	127	17,199	135·4
S. James	68	7,817	114·9	} S. Augustine ...	333	21,187	63·6
S. Augustine ...	250	13,788	55·1				
Bedminster ...	992	45,812	46·1	Bedminster ...	3,031	61,498	20·2
				(Including Somerset added area)			
Clifton	921	29,361	31·8	Clifton	1,717	48,076	28·0
				(Including Westbury and Avonmouth.)‡			
Ashley	434	24,190	55·7	Ashley	995	37,716	37·8
S. Philip	744	51,650	69·6	S. George	1,846	45,229	24·5
Westbury	692	15,540	22·4	S. Philip	736	52,747	71·6
				Stapleton	2,573	17,248	6·7
Bristol City (1891)	4,538*	222,049	48·93	Bristol City (1898)	11,682	316,900	27·12

* Ordnance calculation, including water areas.

† Approximate only.

‡ Avonmouth, here added to Clifton, has an area of 213 acres.

Water Supply.

The Water Supply is in the hands of a Private Company and is obtained by gravitation from springs in the triassic conglomerates, and in the carboniferous limestone on the sides of the Mendips, at points from 5 to 16 miles from the City. The water from two of these springs (Sherborne and Coldbath) is brought directly into the City; that from the other springs is intercepted by the storage reservoirs at Barrow Gurney, 310 feet above Ordnance datum, with a present holding capacity of 750,000,000 gallons, whence it is brought into the City joining the direct supplies at Redcliff. The combined waters supply the lower parts of the City, *en route*, and also rise by gravitation to the pumping Station and reservoir at Oakfield Road (200 feet above O.D.) from which they are pumped up to the Durdham Down service Reservoir (320 feet above O.D.) for the supply of Clifton and the higher parts of the City.

A supplementary supply is obtained from deep wells at Chelvey, eight miles from Bristol, sunk in the new red sandstone (triassic).

The water is supplied to the City at constant service, and the average daily supply per head is calculated at about 22 gallons.

All water supplied from the Barrow Store reservoirs is filtered before delivery.

As to any risk of excremental contamination, the water appears to be above suspicion; and no case of disease has within our knowledge ever been traced to its use.

The Company has power to make an annual charge for each closet flush, in addition to the charges for other domestic purposes (not now enforced in the case of a second W.C. cistern in houses of the gross value of £30 and under), hence very many out-door closets throughout the city are dependent upon hand flushing. After 25th March, 1896, the charge for flushing cisterns in dwelling houses of the gross value of £20 and under, was reduced to one shilling per quarter.

New Source of Supply.—In 1888 the Company obtained powers to take the Rickford Spring, near Blagdon, and the Langford Spring, at Langford, subject to reservation of prior claims of the district upon those springs; and in 1889, they obtained powers to make a reservoir by impounding the river Yeo. This reservoir, to contain a maximum of 1,700,000,000 gallons, will receive the water from these combined sources, and from it the water will be lifted to join the storage at Barrow. The source of the Yeo is from deep springs similar to those furnishing the established supply.

Analysis of Water Supplied by the Bristol Water Works Company.

(Results stated in Grains per Imperial Gallon.)

	GAUGE HOUSE BARROW. (Unfiltered Water.)	COLD BATH SPRING.	DEEP WELL, CHELVEY.
Colour in 2-ft. Tube...	Greenish Brown	Pale Green	Pale Green
Sediment	Sand, Algæ	None	None
Saline Ammonia	·001	·0007	·0002
Albuminoid Ammonia	·004	·0020	·0010
Nitrogen as Nitrates	·09	·12	·17
Nitrites.....	None	None	None
Chlorine as Chlorides	·97	·91	1·13
Oxygen absorbed in 4 hours.....	·039	·003	·014
Total dissolved Solids	19·70	23·50	22·54
Lime	9·06	11·05	9·88
Magnesia	·65	·92	1·18
Sulphuric Anhydride (S.O ₃).....	·86	·98	·83
Lead, Copper or Zinc	None	None	None
Total Hardness.....	16·0	20·5	20·0
Permanent do.	3·5	4·5	5·0

F. WALLIS STODDART, F.I.C., F.C.S.,
City Analyst.

Sewerage, Drainage and Excrement Disposal.

The old City of Bristol is completely sewered, cesspools are not countenanced, and no dry systems of disposal are in use. The aggregate length of the main sewers is about 150 miles, and the cost of construction, commenced in 1851, amounted to about £161,000. The sewers take all storm water, which reaches them by way of trapped street gullies; they are without any external openings or special ventilating outlets, and the manholes are all closed down. Double tidal-valves are fixed at the outlet; these valves are of cast iron, oval or circular, and self-acting, hung on chains, and bedded on indiarubber. In the low level sewers provision has been made for flushing from the Floating Harbour.

Owing to the geographical position of the added Districts the natural outlet for their sewage is through the valley in which Bristol lies.

The S. George Sewer discharges into the tidal river near Totterdown Lock after passing under the Feeder Canal, by an outlet which is close to the S. Philip's Sewer outlet.

The Stapleton and Fishponds Sewer connects to the S. George's system at the junction of the Fishponds and Stapleton Roads.

Horfield discharges a considerable amount of its sewage into the tidal river by way of Cheltenham Road and the Clifton low level sewers. That from the upper part of Horfield is treated at the Ashley Down sewage works, the effluent discharging into the Boiling Wells stream which finds its way into the Frome and thence into the Floating Harbour.

Part of the Totterdown and Knowle sewage is discharged into the tidal river near Brislington Crescent, Bath Road. The upper part of Knowle is drained into cesspools, but the sewerage of the whole district has been engaging the attention of the Sanitary Committee, since inclusion, with the view of the complete sewerage of the district and the

abolition of the cesspools. The Bedminster Down Sewer connects with the Parson Street Sewer and discharges near Clift House into the Avon.

The sewage from the whole City is discharged without treatment into the tidal Avon, and the rapid scour of the tide, which in this Channel is of exceptional force, generally results in the removal of the sewage without offence, although in remarkably dry summers, when fresh water is deficient in the river, some nuisance is complained of.

Main Drainage.

A comprehensive report has been recently made to the Council by Messrs. Jno. Taylor, Sons and Santo Crimp, of Westminster, of which the following is a synopsis:—

Synopsis of Report.

In the first part of the report the area of the City as now constituted is dealt with, and it is calculated that the building area extends to 9,750 acres. The population which it is considered advisable to deal with in designing permanent works is 500,000, and if the rate at which the population has been increasing since 1871 is maintained, the population in the City will in 45 years amount to the number given.

The future dry weather sewage flow is estimated at 30 gallons per head per day, or a total of 15 million gallons.

The question of the provision for the proportion of rainfall is very fully dealt with, and in the result it is suggested that the proposed intercepting sewer should be capable of carrying off 85½ million gallons per 24 hours. The suggestions made from time to time for dealing with the sewage of the City are then dealt with and the proposals to apply the sewage to land at Sand Bay and at Kenmore are disapproved of upon the grounds of excessive cost and unsuitability of the land.

The details relating to the process for dealing with the sewage by means of chemicals are next discussed, and it is suggested that if works of that class are adopted they should be situated below Pill, upon about 13 acres of land, and that the sludge resulting from the treatment should be taken to sea by means of steamers. These works are estimated to cost £366,000. The annual charge for repayment of capital and interest in 40 years would be £14,928, whilst the annual charge for working expenses is given at £7,300. The annual cost of pumping, which latter item is said in the report to be necessary in any scheme that may be adopted, is estimated at £2,400 a year.

The Charlcombe Bay scheme is next dealt with and the scheme is disapproved of on the grounds that it would be extremely difficult and costly to construct, and that in consequence of the sewer being unable to discharge until some hours after high water the sewage would be carried along the shore to the possible prejudice of Clevedon. The estimate for the work is £769,272, and the annual cost £31,376.

The float experiments made by the City Engineer are next referred to, and diagrams of these are bound up with the report. The inference drawn from these experiments is that under suitable conditions the sewage might with propriety be discharged into the Avon at a point near Dunball Island.

Black Nore is also said to be a suitable place for the discharge of the sewage, but the scheme for taking the sewage to that point would be much more costly than that last referred to.

The question of pumping is next dealt with and reasons are given why pumping is essential, together with the annual cost of the operation.

The probable effect on the Bristol Channel towns is next discussed, and references to other towns in the Bristol Channel are made, as well as to Portsmouth.

The cost of the Black Nore scheme is estimated at £522,100, the annual cost would be for repayment of capital and interest £21,295, the cost of pumping, etc., £2,400, total annual cost £23,695.

The estimated cost of Avonmouth or Dunball Island outfall is £379,700, the annual cost being for repayment of capital and interest £15,487, pumping, etc., say £2,000, total annual cost £17,487, annual cost after 45 years about £2,500. This scheme is recommended for adoption and the report states that in the opinion of the engineers such a scheme if properly designed would be sanctioned by Parliament. The concluding pages of the report suggest a general scheme for the Avon Valley, which would intercept not only the sewage of Kingswood and the districts adjacent thereto, but might also with advantage be extended to Bath.

Ventilation of the Sewers.

The question of ventilating the Public Sewers has lately been revived on account of some complaints of nuisance in regard to sewer gullies requiring water during the past summer. Ventilation of the sewers can only be asked for on two grounds—1st, to prevent danger to health; 2nd, to prevent nuisance. The City records for many years past show there is no need on the first score; and the experience of many towns where the sewers are ventilated points to a serious preponderance of complaints of nuisance in the towns where ventilation is in vogue, and suggests inadvisability on the second score.

This following report upon this important and frequently recurring question was presented in November to the Council, who decided by unanimous vote to adhere to the present system of unventilated sewers.

Ventilation of Sewers.

REPORT BY
MESSRS. J. TAYLOR, SONS & SANTO CRIMP, M.M. INST., C.E.

In accordance with the request of the Chairman of the Sanitary Committee we beg to offer the following observations on the question of sewer ventilation, and may say that this matter has engaged our careful attention for years past. We have long been familiar with the fact that Bristol Sewers are unventilated, and in order to ascertain whether this circumstance produced any effect inimical or otherwise upon the health of the inhabitants of Bristol, we analysed the death rate extending over the years 1880 to 1890, and compared it with that of Brighton for the same period, Brighton being a town with fully ventilated sewers, and with a tidal outfall like that of Bristol. We find that during the period referred to, the average zymotic death rate in Brighton was 2·16, whilst at Bristol it was only 2·12. We went a step further and separated from the general death rate the cases which are generally associated with sewer gas, namely, diphtheria, diarrhoea, and fever, and found that during the same period the deaths were, at Brighton 0·98, and at Bristol 0·77. If these figures prove anything at all, they seem to show that the health of the inhabitants of Bristol is not prejudicially affected by the fact that the sewers are unventilated.

Dealing with the subject from another aspect, we may say that the necessity for ventilating sewers can only arise from two causes.

In the first place, if it should become necessary for men to enter the sewers for cleansing purposes or repairs, it is essential that the sewers should be cleared of foul gases

before the men go into them, and this in the case of the London sewers is accomplished by opening the side entrance doors on the line of sewer some few hours before the men descend into them, unless it should happen that the sewers are plentifully provided with open ventilators.

In the second place it has been stated by some authorities that if sewers are not ventilated there is a risk of the sewer air being forced through the house drains into the houses, but it has always seemed to us that if a house is properly drained, that is, the house drain in the first place being provided with an intercepting trap and with a soil pipe carried above the level of the roof, this could not occur, because if the sewer air were forced through the disconnecting trap it would escape up the soil pipe rather than force its way through the traps and sanitary appliances into the houses.

We understand that some residents are in favour of the sewers being ventilated, but we cannot recommend your Council to take that course, because some thousands of ventilators would be necessary, and cost apart (say £40,000), we are certain the ratepayers in the vicinity of each ventilator would rebel against its existence, and a pressure that would prove irresistible would be brought to bear upon the Council, which would lead to the closing of the ventilators.

J. TAYLOR, SONS & SANTO CRIMP, M.M. INST., C.E.

27, GREAT GEORGE STREET,

WESTMINSTER, S.W.

Report by the Medical Officer of Health.

Statistical Evidence that there is no excess of Mortality, of Fever, or other illness which might be attributed to sewer influence in Bristol as a whole, or in Clifton as a District of Bristol.

From the Registrar General's last published Annual Summary (1897).

Death Rates for the 10 years 1887—96

	All Causes per 1,000 living.	Infant Mortality per 1,000 Births.	Fever.	Diphtheria.	Diarrhoea.
			per 100,000 living.		
33 Great Towns	20·6	167	20	29	84
London ..	19·9	155	15	45	67
Brighton ...	17·7	149	11	18	66
Croydon ...	14·5	126	11	32	46
Bristol (includ- ing Clifton)	18·9	144	11	13	49
Clifton (from local returns)	13·8	115	8	6	21

Here are the death rates from all causes, the Infant Mortality (per 1,000 births) and the death rates from Fever, Diphtheria and Diarrhoea, which may reasonably be looked to as indicative of good or bad Sanitary condition. Ten years is a reasonably long period, enough to equalize results and prevent accidental error.

Croydon is chosen for comparison because it has the lowest general death rate of the 33 great towns, is, with good reason, proud of its healthiness, and is a "ventilated" town: so is London, and so are most if not all of the 33 towns. Brighton is included for similar reasons.

As to general death rate, that for Bristol, while below the rate for London and the 33 towns, is higher than that for Croydon and for Brighton; but the Clifton rate is below that for Croydon, and considerably below that for Brighton.

AS TO FEVER.—The rate for Bristol (unventilated) is exactly equal to the rate for Croydon (ventilated), and is also exactly equal to that for Brighton (ventilated). So far as the important question of Fever mortality is concerned, then, towns using exactly opposite systems as to sewer ventilation, are upon an equality. The rate for Clifton (unventilated) is considerably below the rate for Croydon, and equally below the rate for Brighton.

The Fever rates for Bristol and Clifton are both markedly below the rate for London, and for the 33 towns.

As Bristol is an old, densely populated, and closely built city, the Fever rate might be supposed to be in excess in comparison with the rate for Croydon, especially if unventilated sewers had any ill effect, but it is equal to it, and that for Clifton is much lower.

AS TO DIPHTHERIA.—The rate for Croydon (ventilated) is more than double the rate for Bristol (unventilated), and more than five times the rate for Clifton (unventilated).

The rate for the 33 great towns is more than double the rate for Bristol, and the London rate is more than three times as large as that for Bristol.

The rate for Clifton is less than half the Bristol rate, less than a quarter of the rate of the 33 towns, and is less than one-seventh of the London rate.

Brighton shows a Diphtheria rate higher than that for Bristol, and three times as high as the rate for Clifton.

Some increase in Diphtheria mortality has of late years been observed in Bristol, as in other large towns, but in a far less degree.

It is obvious that, if the smaller increase of Diphtheria in Bristol is to be attributed to the unventilated condition of the sewers; the far greater increase in other towns may, with equal reason, be ascribed to the ventilated condition of their sewers; the healthiest of these towns show Diphtheria mortality rates which are from three to five times as high as that for Clifton.

AS TO FATAL DIARRHŒA.—The rate in Bristol is 49 (per 100,000) as compared with Croydon's 46, with Brighton's 66, with London's 67, and with the 33 great towns' 84.

The Croydon rate, 46, is more than double that for Clifton, which is only 21.

INFANT MORTALITY.—That for Croydon, 126, is very favourable; but Clifton is considerably lower, 115.

The Bristol rate, 146, is the next lowest of the 33 great towns, which collectively show a rate of 167; and is below Brighton, which is 149, and London, which is 155.

Figures for ten years thus show that old Bristol need not fear comparison with a new town (Croydon), somewhat remarkable for healthiness; or with other great towns generally, or with London.

Clifton (including a populous working-class district in the Hotwells), stands far above these towns for general health, and especially for its freedom from Fever, Diphtheria, and Diarrhœa.

Ventilation of the Bristol Sewers.

This question must be kept dissociated from the totally different matter, Removal of the Sewage from the River, which is now being dealt with by the Council.

From the point of view of these statistics, published under the authority of the Registrar General, there is no evidence that any improvement is to be gained as to our Fever rate, while it would be most regrettable if one of the first results of sewer ventilation was an increase of our Diphtheria rate, at present remarkably low, especially in Clifton, to the level of other "ventilated" but otherwise sanitary towns.

As to complaints of nuisance arising from street gullies—these occur when, owing to continuance of dry weather, the water-seal evaporates, thus allowing irregular ventilation; these complaints are comparatively infrequent, and neither so constant nor so serious as the complaints of street grids and ventilating shafts in “ventilated” towns. Whether the Sewers are ventilated or not, all house drains must be properly disconnected and independently ventilated, as they are under present circumstances; when this is done, sewer gas cannot enter the house through the house drains, but escapes by the vent pipe carried up to the roof. The system is equally safe with either type of sewer.

What are we to gain by reconstructing the sewers as a Ventilated System?

There is no reason to expect any improvement in the present satisfactory returns as to sickness and mortality.

There is no reasonable hope of improvement, but rather the reverse, as to complaints.

There may be an increased mortality from certain forms of disease (*e.g.*, Diphtheria).

An immense sum of public money will be spent for no conceivable good end.

In certain old towns with unventilated sewers, Enteric Fever used to be in excess; following the introduction of ventilated sewers came a reduction in Enteric Fever prevalence, which was referred to the change in the type of sewer.

It is in reality the provision of better sewers, the prevention of water contamination by sewer leakage, and the greater care given to the control, isolation, and nursing of cases, and the disinfection of infectious discharges, that has caused a marked diminution in Enteric Fever mortality:

in fact the change must be ascribed to improvement in Public Health organisation generally, rather than to the superiority of one type of sewer over another.

The kind of sewer, ventilated or unventilated, exerts no influence on the Fever rate; and the cause of epidemic outbreaks of Enteric Fever must be looked for elsewhere than in occasional foul smells from grid or grating.

D. S. DAVIES, M.D., D.P.H.,
Medical Officer of Health.

PUBLIC HEALTH OFFICES,
40, PRINCE STREET,
BRISTOL, *October*, 1898.

Report by the City Engineer.

The Borough Surveyor of Ashton-under-Lyne, Mr. J. T. Earnshaw, C.E., has placed at my disposal some valuable information obtained from 81 of the most important towns and Urban Districts of England, having a total population of 6,775,910, or an average of 83,653 each.

Of these Bristol does not ventilate the sewers in any way; Macclesfield and Stafford were considering the question in connection with new main drainage works; Bath does not ventilate systematically, and Lincoln only partially; the other 76 towns answered the question: "Do you ventilate your sewers?" in the affirmative.

The 78 towns having whole or partial ventilation have adopted several systems or combinations of systems and may be grouped as follows:—

Group A.—Nineteen towns of an average population of 68,614 each have the sewers ventilated by means of surface openings on the street level only.

Group B.—Forty towns of an average population of 95,880 each combine surface openings with special shafts erected in the streets, or against houses and high buildings.

Group C.—Nine towns of an average population of 104,212 each have surface openings, special shafts against buildings, and openings connected with factory chimneys.

Group D.—Eight towns of an average population of 41,333 each have surface openings, special shafts against buildings and Holman's sewer gas destroyer.

Group E.—Two towns of an average population of 44,273 each are ventilated by special shafts only.

It will be seen that of the towns having ventilated sewers 73 per cent. use surface openings in the street combined with shafts, and 24 per cent. use surface openings only.

The various towns appear to use generally over the whole of their respective areas any system they have adopted.

The Surveyors of the various towns were asked to state whether their respective systems proved satisfactory, and the replies were as follow :—

				Answers in the Affirmative.	Answers Doubtful.
<i>Group A.</i>	...	...	...	14	5
„ <i>B.</i>	...	...	...	18	22
„ <i>C.</i>	...	...	...	6	3
„ <i>D.</i>	...	...	...	5	3
„ <i>E.</i>	...	...	...	2	0
				—	—
				45	33

The replies to the next query: “Have you had any complaints relative thereto from the Public?” were as follow :—

			Affirmative.	Negative.	Doubtful.
<i>Group A.</i>	...	...	14	5	0
„ <i>B.</i>	...	...	21	16	3
„ <i>C.</i>	...	...	4	4	1
„ <i>D.</i>	...	...	4	4	0
„ <i>E.</i>	...	...	0	2	0
			—	—	—
			43	31	4

The question as to whether the Surveyor can say that “the adopted system of ventilation has had any appreciable effect upon the health of the town” has elicited a number of answers of interest only as showing that the Surveyors generally feel some difficulty in giving a direct reply. One Surveyor, however, states that in his town the system, Group *B*, has “undoubtedly” had a good effect; another, Group *E*, says, “Yes, a great deal”; another, Group *B*,

answers “certainly,” and six others say “Yes.” On the negative side one Surveyor, Group *B*, answers emphatically “certainly not”; another, Group *E*, says “No, I cannot,” and three others give a direct negative. The great majority, however, 64 in number, either give no answer at all or answer doubtfully. Grouped, the answers are as follow :—

			Affirmative.	Negative.	Doubtful or None.
<i>Group A.</i>	...	...	1	0	18
„ <i>B.</i>	...	...	4	3	33
„ <i>C.</i>	...	...	2	1	6
„ <i>D.</i>	...	...	1	0	7
„ <i>E.</i>	...	...	1	1	0
			<hr/> 9	<hr/> 5	<hr/> 64

The Surveyors state, with one exception in Group *D*, that a man can safely enter the sewers, but the same answer applies to the non-ventilated sewers of Bristol.

If the drains from houses are disconnected from the sewer by intercepting traps, no emanations from the sewer can reach the house drains unless the trap is ineffective, and if the house drains are ventilated any sewer gas going through the trap passes away through the ventilating shafts of the houses.

Where sewers are properly constructed with rapid falls the sewage is not retained sufficiently long for decomposition to set in and no sewer gas is evolved.

I have made experiments to ascertain the rate of flow in the Clifton High Level Main Sewer, which has a gradient of 1 in 300, and find that with the dry weather flow the speed is one mile in an hour. Most of the branch sewers have much steeper gradients, so that any sewage discharged from houses in Clifton or Redland probably finds its way into the tidal river within two hours. When any rainfall occurs the speed of the flow in the sewer is very greatly increased. The velocity of a sewer three feet in diameter with a gradient of 1 in 300 running full is 355 feet per minute.

The question of sewer ventilation is a vexed one, subject to much difference of opinion, but I do not consider that the effect produced in those places that have adopted some means of ventilation for their main sewers is sufficient to warrant interference with a system which works in a satisfactory manner; the proof of the satisfaction being in the few cases of complaint of sewer gas from the street gullies, which would be the first places to give indication if they became untrapped for want of water. Many persons who talk of sewer ventilation do not consider that it means, if properly carried out, thousands of openings direct from the sewer on to the surface of the streets, with other vents carried up houses, trees, or specially designed posts at the sides of the footpath, discharging their gases at the level of the bedroom windows. I feel sure that for every complaint we now get of smells from a street gully we should have a hundred of smells from the ventilators, and that the state of things would be worse for the public health.

T. H. YABBICOM, M. INST., C.E.,
City Engineer.

BRISTOL, *October*, 1898.

Cleansing, Ashing, and Street Watering.

This work, formerly carried out by contract, was in November, 1892, taken by the Sanitary Committee into their own hands, under the supervision of the City Engineer, who reports to the Committee. The erection of the Destructor at Albert Road, St. Philip, has led to the discontinuance of the old Refuse Tips, which caused some inconvenience and much complaint. About 650 tons of refuse are destroyed weekly. The present Destructor consumes about half the refuse of the city, the remainder is removed to selected tips outside the city. Additional Destructors will need to be provided shortly, in order to deal with the whole of the material collected.

Isolation Hospitals.

Population of extended City 1898, 316,900.

Advisable isolation provision, 300 beds, to provide for all cases, including those formerly isolated by the Guardians.

Fever Hospital, Ham Green.—Accommodation allowing 2,000 cubic feet per bed—76 beds.

Smallpox Hospital, Nover's Hill.—Accommodation allowing 2,000 cubic feet per bed—35 beds.

Stapleton Hospital.—In occupation by the Bristol Guardians pending permanent arrangements—12 beds.

St. George's Hospital.—The cottages in rear have been pulled down, the premises repaired and a bath-room fitted. At present retained for use as a Refuge under Sec. 15 of the Infectious Disease Prevention Act, 1890, or for emergency use.

St. Philip's Hospital.—Closed awaiting emergency.

Clift House Hospital.—Closed except for emergency.

Slaughter Houses.

No decision has been arrived at by the Health Committee as to the provision of Public Slaughterhouses. There are now 126 Private Slaughterhouses in the City as extended and 2 belonging to the Docks Committee, one at Hotwells and the other at Avonmouth. There is also one knacker's yard in S. Philip. All the newly included slaughterhouses have been carefully inspected, and the private slaughterhouses generally are regulated and kept in as good condition under the byelaws as is possible considering the defects of position and structure which render a large number of them unsuitable for the purpose.

VITAL AND MORTAL STATISTICS.

Births.

The births registered in Bristol in 1898 were 9,061, of which 225 were returned as illegitimate, a percentage of 2·4.

The birth rate for the year was 28·5, a slight increase on the rate of last year, which was 28·0; the rate has since 1881 shown an almost continuous decrease, interrupted by a slight rise in 1889, and again in 1891, 1893, and 1897 (Table B). The rate for the 33 great towns in 1898 was 30·3.

The excess of births over deaths during the year 1898 (*natural increase of population*) is 3,620. The estimated *actual increase* from 1897 by extension of the boundaries and otherwise, is 84,658: but no estimate of the increase suitable for comparison with that of previous years can be framed.

Marriages.

2,742 Marriages took place within the Borough of Bristol during 1898, viz., 837 in the Bristol Union, 1,477 in the Barton Regis Union,* and 428 in the Bedminster Union divisions of the Borough. The annual marriage rate per

* The Barton Regis Returns include the extra Municipal portion of that Union, this makes the rate slightly in excess of the truth.

1,000 living is thus 8·6. As the population has recently been altered by extension of the boundaries no comparison with the rates in previous years can be instituted. The area from which marriages are returned has not coincided with the Borough of Bristol and consequently the marriage rate has never been quite definitely ascertained. The adjustment of the Poor Law and Registration areas which is now being made will in future amend this,

Deaths.

5,441 Deaths were registered in the District during the 52 weeks ending 31st December, 1898, of which 104 or 1·9 per cent. were returned as deaths of illegitimate children. The general death rate for the year, uncorrected for age and sex distribution, is 17·17 per 1,000 living,[†] which happens to be exactly the same rate as that for 1897.

Infant Mortality.

Of the 5,441 Deaths, 1,491 were of infants under one year. The proportion of these deaths to every 1,000 births (Infant mortality) was 164·55, a considerable increase on our previous rates for 21 years. The increase was due to the fatal prevalence of Measles (*q.v.*) in the early part of the year, and of Diarrhoea in the autumn. A similar rise, amounting to a rate of 11 per 1,000 above the 10 years' average was recorded in the 33 large towns of England and Wales.

[†] As various towns differ much in the sex and age distribution of their population, it is obvious that a town containing a too large proportion of very young or of very old persons, or of males, amongst which classes the death-rate is almost invariably in excess, will compare unfavourably with another town in which the distribution of the population is nearer the average, although the death-rates of each successive age period might be precisely similar in the two towns. A correction factor is supplied by the Registrar-General, by which the disparity of age and sex distribution is equalised for the great towns. The factor for Bristol is 1·0379, and multiplying the observed death-rate by this factor, the corrected rate, which is now comparable with the corrected rates for other towns, is 18·33.

This rate varied thus :—

198·8	in Redcliff.
186·4	in St. Augustine.
177·4	in St. Philip.
166·1	in St. George.
165·1	in St. Paul.
162·2	in Bedminster.
135·0	in Ashley.
129·6	in Stapleton.
129·0	in Clifton.

In Table **B** will be seen the annual infant rates in Bristol for the past 22 years. During the year 1898 the infant mortality ranged in the large towns from 225 in Preston, 212 in Salford, 208 in Gateshead and 206 in Blackburn, to 158 in Cardiff, 156 in Portsmouth, 153 in Huddersfield and 150 in Croydon.

Mortality at Ages between 1 and 60.

2,459 Deaths were returned, corresponding to an annual rate of mortality per 1,000 living between these ages of 8·7 compared with a rate of 8·8 in 1897. The rate for the 33 great towns between these ages was 10·3 in 1897, and 10·2 in 1898.

Mortality amongst Aged People.

1,455 Deaths of persons aged 60 and upwards were registered, whose ages averaged 72 years. The rate of mortality amongst persons living at these ages was in Bristol 65·1, compared with a rate of 71·4 in 1897, and for the 33 great towns was 70·3 in 1897, and 71·2 in 1898.

VACCINATION.

The 1897 returns are the last complete ones available. I am indebted to the Clerk of the Bristol Union for the following information:—

	BRISTOL UNION.
<i>Vaccination.</i>	
Number successfully vaccinated up to 31st January, 1899.....	4,869
Insusceptible.....	21
Died unvaccinated	987
Postponed by Medical Certificate	389
Certificates of Conscientious Ob- jection	97
Removed to Districts, the Vac- cination Officer of which has been duly apprised	113
Cases left and not traceable.....	709
In abeyance	2,204
Births registered in 1897	9,389
Percentage of successful vaccina- tion to births	57·85
Ditto England and Wales, 1895	67·8

PAUPERISM.

Bristol Union—Summary of persons relieved on the following dates: the first named date (1st April, 1898) being the date of the formation of the Union for the City and County of Bristol.

	1st April, 1898.	1st July, 1898.	1st Oct., 1898.	1st Jan., 1899.
In Workhouse ...	2,357	2,159	2,199	2,403
In Institutions, &c.	114	107	114	115
In Lunatic Asylums	826	798	816	815
Out-door poor ...	7,796	7,288	6,872	6,546
	11,093	10,352	10,001	9,879
Weekly cost of Out- relief	£724 6 1	£704 12 4½	£696 9 7½	£684 13 5

PREVALENCE OF SICKNESS.

Small Pox.

Only 2 cases of Small Pox came under notice during the year. One on February 11th, the case of a man of 21, a steward on a steamship from Alexandria. He was isolated in St. Philip's Marsh Hospital and afterwards on the Hospital Ship, and recovered after a severe attack. The rest of the crew were all re-vaccinated where necessary, and no further spread occurred.

The second case, on July 18th, occurred in a man of 24, employed as a corn-crusher at local Flour Mills. The origin of the case was quite obscure, and none of the employés or any member of the patient's family contracted the disease. He was isolated on the Hospital Ship, and recovered after a modified but characteristic attack.

Both these men had been vaccinated in Infancy, but not since.

Cholera—Choleraic Diarrhoea.

No deaths occurred from this disease during 1898, but 2 cases were notified in September, on the 24th and 29th, of Choleraic Diarrhoea, one in a man of 25, and the other in a girl of 12. Both cases recovered after a short illness. There was no reason to suspect that either case was of the nature of Asiatic Cholera, or that any danger to the Public Health from these cases was to be feared.

Plague.

Three arrivals *ex* steamers from infected ports were notified forward and watched. No illness resulted.

Diarrhoea—Infantile Diarrhoea.

The number of Deaths returned as due to Diarrhoeal Diseases during the year was 348, of which 253 occurred in children under 1 year of age, 74 at ages 1 to 5, 3 at ages 5 to 25, 7 at ages 25 to 60, and 11 in persons 60 years and upwards. These Deaths give a Diarrhoeal Death Rate of 1.09 per 1000 living compared with a rate for the 33 great towns of England of 1.22.

The rate is this year exceptionally high, and indeed exceeds any rate noted in the City before extension for the past 22 years, which is as far back as our accurate records extend.

The continuance of Autumnal Diarrhœa, which is largely dependent upon prolonged elevation of temperature, was considerably favoured by the heat of August and September, when the mean temperature was considerably above the average. In August maxima of 80° and upwards were registered almost daily in the South-Eastern Counties, and locally the month was warmer than usual, while in September there were two distinct periods of heat, the first commencing on the 3rd, culminated on the 8th in temperatures of 90° and upwards in many parts. A second, from the 14th to the 17th, with maxima of 88° and 89° in the East of England, and 83° in Bristol.

The mean temperature of October also showed an excess of over 4° . These Meteorological conditions are important as favouring the excessive mortality from Diarrhœal Diseases, not only locally but over the whole Country.

The Diarrhœal Death rate varied in the Sub-Districts, as follows :—

Sub District.				Rates per 10,000 living.
St. George ...	...	...	...	20
St. Philip ...	...	...	...	14
Bedminster ...	...	...	...	12
Stapleton ...	...	...	...	12
St. Augustine ...	...	...	...	7
Ashley ...	...	...	...	7
Redcliff ...	...	...	...	6
St. Paul ...	...	...	...	5
Clifton ...	...	...	...	2

Diphtheria—Membranous Croup.

During the 52 weeks of 1898, 207 cases were notified as Diphtheria, and 10 as Membranous Croup, a total of 217 under these two headings.

The number of deaths returned as due to Diphtheria was 39, and to Membranous Croup 5, or a total of 44 under the two headings, giving a case mortality from these causes of 20·2 per cent.

The 44 deaths from Diphtheria and Membranous Croup correspond to a death rate from these causes of 14 per 100,000 living, a decrease upon the rate for 1897, which was 15, and for 1896, which was 16. The average rate for the past 10 years in the City of Bristol before extension, was 13 per 100,000 living.

The Diphtheria rate (including Membranous Croup) for the 33 large towns in 1898 was 31 per 100,000 living, which corresponded with their 10 years' average. The rate for the Clifton Registration Sub-District of Bristol in 1898, was 8 per 100,000 living.

Cases Bacteriologically Examined.

244 (144 notified, 100 not notified).

	NOTIFIED CASES. 225 (10 withdrawn.)			NOT NOTIFIED.
	Bacteriologically Examined		Not Examined	Examined on suspicion.
	Positive Result	Negative Result		Negative Result
Total	92	52	81	100
Died of Diphtheria	10	5	28	1
Withdrawn	—	10	2	—
Clinical progress of cases showed not to be Diphtheria	—	2	—	21
Recovery Uncomplicated	36	14	—	39
Recovery after severe attack of Diphtheria.	19	2	—	4
No further information as to progress of case	27	19	51	35

Examination of Secondary Cultures. In 68 instances, the management of the patient as regards isolation was regulated by the bacteriological reports, an improvement upon previous years. In 31 cases 2 examinations were made, in 19 cases 3, in 11 cases 4, in 6 cases 5, and in one case 7 examinations, before the patient was found to be free. Of those cases receiving a negative certificate and entered as not clinically Diphtheria, the subsequent progress showed 16 to be Tonsillitis, simple or associated with Measles, or other specific fever, one acute ulcerative Laryngitis, one septic sore throat, one Bronchitis, one Pneumonia, and one septic Stomatitis, due to retention of a diseased stump under a gold plate and immediately cured by proper attention to the teeth. One case not notified giving negative result, died of Otitis media, a month previously there had been Diphtheria.

The results of Diphtheria Culture examination appear rather disappointing this year, especially the negative results, and this appears to be unavoidable in the case of cultures taken by various hands under many disadvantages.

The Agar Medium which, following Klein's method, had been adopted as more convenient than blood serum, is also not very sure, and since November, control inoculations are always made from the returned swab on to Kanthack's Ascitic Agar, a highly alkaline medium, and peculiarly "selective" for Diphtheria. This reduces the chance of failure very considerably.

The greatest value of this work is in the positive results, which often disclose the presence of an active growth of virulent Diphtheria in throats showing an apparently benign membrane. This was notably the case quite recently, when a doubtful throat case showed a luxuriant growth of Diphtheria, confirmed by Dr. Klein and found to be highly virulent to guinea pigs. This discovery led to examination in 12 other cases of apparently mild throats

(or “Influenza”), wherein Diphtheria was found to be present, and 11 showed a community of milk supply, one of these cases was fatal, similar examples have been recorded in previous Reports.

In 19 houses multiple cases of Diphtheria occurred; 15 houses had 2 cases, 2 houses had 3, 1 house had 4, and 1 house 5 cases.

Thirty-nine houses, in which Diphtheria, or Membranous Croup was notified, were found to have various insanitary conditions, and these conditions were duly rectified. Cases were distributed through the months, thus:—

	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Cases	29	28	24	15	19	12	15	13	18	13	16	18
Deaths	5	6	7	5	3	4	1	2	7	1	1	2

Erysipelas.

During the year 263 cases of Erysipelas were notified, and 6 deaths were returned, compared with 203 cases and 5 deaths in 1897.

The enquiries made into these cases resulted in the discovery of 34 houses where various sanitary defects required attention.

Puerperal Fever.

In order to lessen the ambiguity of the term "Puerperal Fever" in the Notification Act, the following memorandum has been issued to Medical Practitioners, and attached to the Notification Book of Certificates:—

CITY OF BRISTOL.

THE INFECTIOUS DISEASE (NOTIFICATION) ACT, 1889.

PUERPERAL FEVER.

A Committee of the Royal College of Physicians of London has recently endorsed the view that the expression "Puerperal Fever" should be taken to include "Septicæmia, Pyæmia, Septic Peritonitis, "Septic Metritis" and other acute Septic Inflammations in the Pelvis, occurring as the direct result "of childbirth."

The Council of the Obstetrical Society of London suggests the following inclusive definition of the term "Puerperal Fever." That is:—"Septicæmia and Pyæmia, including Peritonitis, and all "cases of acute Pelvic Inflammation occurring in connection with childbirth."

Issued for the information of Medical Practitioners.

D. S. DAVIES, M.D.,
Medical Officer of Health.

Public Health Offices, 40 Prince Street,
March, 1899.

Scarlet Fever or Scarlatina.

The number of cases of this disease notified and confirmed during the 52 weeks of 1898 was 382, compared with 511 in 1897, 1,352 in 1896, 562 in 1895, 485 in 1894, 1,245 in 1893, with 1,442 in 1892, and with 888 cases in 1891; and the number of deaths returned was 14, compared with 18 in 1897, 59 in 1896, 16 in 1895, 16 in 1894, 35 in 1893, 47 in 1892, and 37 in 1891. The returns are extremely low for this year, especially when it is remembered that the City has been increased by 84,000 persons. It happens to be an inter-epidemic period for the West of England.

The percentage of deaths to cases in the whole City was 3·6, compared with a case mortality of 3·5 in 1897, 4·3 in 1896, 2·8 in 1895, of 3·2 in 1894, of 2·8 in 1893, of 3·2 in 1882, and of 4·1 in 1891. The distribution of attacks by age is shown below:—

Under 5 years	...	...	...	130
5-10 „	...	...	...	152
10-15 „	...	...	...	52
15 upwards	...	...	...	48
Total	...	...	...	382

The notification figures for the four quarters are as follow:—

1st quarter	...	...	...	109
2nd „	...	...	...	77
3rd „	...	...	...	66
4th „	...	...	...	130
Total	...	...	...	382

The distribution of cases in Registration Sub-Districts is shewn in Notification Table β.

It will be seen from Notification Table δ, that fewer cases of Scarlet Fever have been notified in 1898 than in any year since the adoption of the Notification Act in 1890, and that the number of deaths from this cause is lower than can be found for the past 23 years, of which accurate records are available.

Unfortunately we cannot hope that this favourable condition can be maintained, but it is satisfactory that the inter-epidemic figures should fall so low, and it is to be hoped that the figures of the next epidemic wave will show the continuous decrease noticeable of late years, and due no doubt to the extension of Hospital Isolation, and supervision of infected dwellings and of schools.

The number of cases of Scarlet Fever admitted to the City Hospitals during the year has been 170; 14 were removed by the Guardians, and 3 were admitted into the other institutions, so that 187, or just half the number of cases notified were isolated in Hospital. I shall not be satisfied that the benefits of isolation are being utilized to the full until *at least* 80 per cent. of the notified cases are cared for in Hospital. The percentage mortality amongst Hospital patients amounted to 2 per cent., whereas the mortality amongst those nursed at home reached 5 per cent., a favourable contrast, even taking all reasons for non-removal and the smallness of the figures dealt with into consideration.

Since 1887 the Scarlet Fever rate has consistently remained below the mean, and it is at least suggestive that during this period, and especially since 1889, when the Notification Act first gave us accurate information as to the location of disease, systematic isolation of Scarlet Fever has been commenced and extended so far as has been possible with the insufficient Hospitals at our command.

It is now difficult to realise the frightful mortality from Scarlet Fever in former epidemic years, a mortality chiefly incident upon children. Thus in 1863 no less than 925 deaths occurred from Scarlet Fever alone, and again in 1870 this disease killed 746, and large and fatal epidemics recurred with fair regularity every 5 to 7 years. The fatality of individual epidemics has decreased of late years, and in 1887, the last epidemic year, the deaths numbered 217. For the past ten years (1889–1898 inclusive) the yearly number of deaths from this disease has averaged 31.

Typhus Fever.

No case of Typhus Fever was reported in the City during the year. The last known cases of this disease occurred in the winter 1889-90, the disease was strictly localised to a small group of houses and resulted in 5 cases and 1 death (*See Report for 1889*).

Enteric Fever.

During the year 113 cases were notified as Enteric Fever compared with 343 in 1897, 110 in 1896, 89 in 1895, 90 in 1894, and 122 in 1893.

This table shows the Notifications and deaths for the past eight years.

Years.	Cases Notified.	Attacks per 100,000 Living.	Deaths.	Deaths per 100,000. Living
1890	122	55	33	15
1891	116	52	23	10
1892	135	60	18	8
1893	122	54	26	11
1894	90	39	21	10
1895	89	39	22	9
1896	110	47	20	8
1897*	343	147	47	20
1898†	113	35	26	8

* The excess in 1897 was entirely due to the Milk-borne outbreak in Clifton of September–November, which gave rise to 244 cases and 30 deaths: excluding these cases, the number would have remained at or below the average; the figures have, as was anticipated, fallen to or below the normal low figures for this City, in which Enteric Fever is not as a rule unduly prevalent, as the conditions are not favourable for its persistence.

† City enlarged,

The prevalence and fatality of the disease in each quarter of the year is shown here.

	CASES.			DEATHS.		
	1896	1897	1898	1896	1897	1898
1st Quarter	34	20	34	3	3	8
2nd Quarter	34	17	12	8	5	2
3rd Quarter	21	38	29	2	5	6
4th Quarter	21	268	38	7	34	10
	110	343	113	20	47	26

Enteric Fever is admitted into the Public Institutions and into the Guardians' Hospitals for treatment, and 55 cases (2 from outside the city) were nursed in the Royal Infirmary, General Hospital and Children's Hospital during the year, 1 case was nursed at Clift House, and 6 were treated by the Guardians.

Examination of Blood by the Widal Method.

This method of confirming or assisting a diagnosis of Enteric fever, which proved invaluable in 1897, has also had extended use during 1898, and has continued to give excellent results.

During the year, 120 cases from the City were examined, and 10 from outside, involving altogether 215 experimental observations.

At the end of the year, the practitioners who forwarded the blood for examination in each case were asked to furnish me with the clinical progress of the case, so that some idea of the comparative value of the examination

might be formed, and in all but 6 cases the required information was obtained with a readiness which is characteristic of the attitude of the Medical Profession in this City towards the Health Department.

Positive Results.

Of the 120 cases, 58 gave results which were decided to be confirmatory of Enteric fever, and in only one instance, amongst my returns, did the progress of the case (Catarrhal Gastritis) negative the conclusion. This patient, however, had had Enteric fever 10 years previously, and the phenomena observed (marked clumping within time limit with both 1-20 and 1-50 dilutions, but clumps floating, and considerable persistence of motility) were consistent with an unusually marked "survival" reaction.

The observations are made, as a practice, first with 1-20 dilution, if this gives a positive result, with 1-50.

In most of these 58 examinations, the reaction was complete as to clumping and motility, and well within a time limit of half an hour for both dilutions. In 10 considerable motility is noted as persistent, though the clumping was marked and the clumps fixed. In 3 cases the clumps, though marked, were movable or floating (raft clumps). In 2 cases previous Typhoid was noted. "Spinners" were especially noted in 8 of the positive results, and in one of the indeterminate results, which subsequently proved to be Typhoid. I am inclined to look upon this curious action, when it occurs, as characteristic of the true reaction.

Negative Results.

50 specimens gave no indication of reaction, either of clumping or loss of motility in from 1-3 hours in dilutions varying from 1-20 to 1-5, and the subsequent development of these cases agreed with the experimental observation; except in one case in which the patient died, apparently of Enteric fever, but no post-mortem examination was obtainable. The examinations in this case were made on the 7th and 14th days of the illness.

The other cases included 9 of Pneumonia, 4 of Influenza, 3 of Ulcerative Endocarditis, 2 of Tubercular Peritonitis, 2 of Malaria, 2 of Empyæma, 2 of Phthisis, 2 of Gastro-intestinal Catarrh, 1 of Round-worm, 1 of Mediterranean Fever, 1 of Acute Septicæmia, 1 of Pleurisy, 1 of Acute Tonsillitis, and 1 of Acute Mania.

One case of previous Typhoid, 15 years ago, gave practically negative results; a few bacilli showing some adherence into small movable raft clumps, but the majority remained unaffected for considerably over the time limit.

Indeterminate Results.

6 cases gave results upon which no definite opinion was based.

Case 283 gave, however, a positive result upon a second examination, which was confirmed.

Case 302, gave positive results as to clumping, but the remaining motility was so marked that no opinion was expressed, it ran the course of Enteric fever.

Case 351, which proved to be appendicitis, gave with 1-20 and 1-50 some clumping in half an hour's time, but much motility even after 3½ hours in both dilutions.

Case 361 gave no loss of motility, and only slight adherence in 1-25 and 1-35 in an hour, it ran a course decided to be Enteric, followed by recovery.

Case 291, gave a doubtful result with 1-10 dilution; some clumping, but much remaining motility. The examination was not completed with 1-50 dilution, it proved to be Broncho-Pneumonia.

Case 287 showed movable clumps, but very active motility after 2 hours; no record was obtained as to this case, so it was probably not Enteric fever, or it would have been subsequently notified,

One case which had Enteric fever in 1897 was examined after twelve months' interval, and showed a complete and characteristic reaction.

35 cases of Enteric fever were notified without being submitted to the Widal test.

The results recorded here show that with some experience and care this reaction is a very valuable aid to clinical observation, and its greatest value appears to consist in this, that the exact nature of a doubtful continued fever may oftentimes be decided many days earlier by the biological test than by clinical observation, so that it proves of service not only in the interests of preventive medicine, but also, and very specially, in the interest of the patient.

BRISTOL ROYAL INFIRMARY.

Dr. Symes, Bacteriologist to the Royal Infirmary, kindly furnishes the following particulars of his cases:— 71 cases examined, 20 gave positive results, 49 negative, and 2 doubtful.

Of the 20 positive all proved clinically, or on post-mortem examination, to be Enteric.

Of the 49 cases giving negative reactions 45 were proved by clinical observation or post-mortem examination not to be Enteric, 4 proved to be Enteric, and in each of these a positive result was obtained some days later. Three of these cases were examined on one day when my culture was so obviously defective that I asked that specimens should be sent to the Health Department, when the result was positive.

In the fourth case I examined the blood on the 18th day, using a dilution of one in thirty, and got no reaction. The case clinically was one of Enteric Fever, and a positive reaction was obtained in the Health Laboratory on the 20th day (*"Washer"*, 449 1898.)

During the first nine months of the year I used a dilution of 1 in 20 or 1 in 30. Since then I use a dilution of 1 in 50.

Amongst cases examined giving negative results are Rheumatic Fever, Pneumonia, Diarrhœa, Influenza, Measles, Malaria, Anæmia, Meningitis, Appendicitis, Septicæmia, &c. Of the two "doubtful" cases, one was Malaria. Inhibition of movement occurred in these cases but no "clumping."

Measles.

The deaths from Measles in the Enlarged City numbered 309 compared with 57 in 1897, with 143 in 1896, 8 in 1895, 116 in 1894, 25 in 1893, 105 in 1892, and 239 in 1891. The mortality, per 100,000, living was 97 compared with a mortality in the 1891 epidemic of 109 per 100,000.

Of the 309 deaths, 294 were of children under 5.

Measles is not a notifiable disease, and opinion is divided as to the advisability of its inclusion.

On the one hand its early infectivity and rapid spread appear to preclude the possibility of effectually controlling its epidemic prevalence by the usual means of Hospital isolation and disinfection, while the enormous bulk of cases during any wide prevalence would render complete Hospital isolation of all cases impossible without extraordinarily ample ward accommodation. On the other hand Measles is undoubtedly a regularly recurring cause of immense mortality, much of which might be prevented by careful nursing during the stage of convalescence; and, with extended Hospital accommodation, it may be possible to afford valuable aid by removal, so as to secure proper nursing, and avoid the heavy mortality due to exposure during convalescence.

On the whole, and with present available means of isolation, the control of school attendance would appear to be the most hopeful method of procedure, and in this way heads of schools can most effectually further the efforts of your Authority by giving information of cases, and of families known to be affected.

The prevalence and fatality of this year's epidemic show, however, that these measures by no means effectually control its spread. The first quarter of the year furnished 216 deaths, the second quarter 80, the third 10, and the last quarter 3, so that by the end of the year the disease had practically disappeared.

Whooping Cough.

The deaths from Whooping Cough in the Enlarged City numbered 110 compared with 118 in 1897, with 64 in 1896, 45 in 1895, 177 in 1894, 80 in 1893, with 154 in 1892, 53 in 1891, and 201 in 1890.

Of the 110 deaths, 108 were of children under 5.

In each of the first and second quarters of the year 22 deaths occurred, 26 in the third and 40 in the last quarter of the year.

The disease was most fatal in St. Philip (32), Bedminster (30), and St. George (19).

The mortality in this disease is largely due, as in the case of Measles, to the want of care exercised during the course of the disease, to avoid exposure to inclement wind and weather.

Influenza.

This disease caused 57 deaths during the year, compared with 40 in 1897, 19 in 1896, 95 in 1895, 26 in 1894, 68 in 1893, and 45 deaths during 1892.

The disease was chiefly prevalent during the first quarter of the year, and the figures for the four quarters are 42, 9, 1 and 5 respectively.

Phthisis (Pulmonary Consumption).

The deaths from this disease form no inconsiderable proportion of the total deaths, and from year to year nearly approach and occasionally exceed the fatality of the seven principal Zymotics grouped together :—

	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898
Phthisis... ..	332	333	326	413	382	372	363	332	317	320	302	393
Seven Principal } Zymotics }	664	292	500	482	426	461	363	457	268	435	430	851

I have in previous reports pointed out that there appears to be no valid reason for the continued existence of this fatal scourge in anything like its present proportions, if to the medical treatment of its symptoms and results, were added some intelligent preventive treatment on the part of the patient.

Isolation in hospital, with the precautions as to exposure and disinfection, are certainly not applicable in the circumstances of Pulmonary Consumption, but *notification* of the disease might reasonably tend towards the universal adoption of such precautions as are indicated below, and would ensure the periodical and thorough disinfection of infected rooms and houses, especially after death, a point of no little importance in the social history of the disease.

The question has received considerable attention during the year and a special report has been prepared on the subject. The precautions appended have been reprinted and issued for circulation :—

Rules for Preventing the Spread of Consumption.*

Pulmonary Tuberculosis (Consumption) is directly communicable from one person to another. The germ of the disease exists in the expectoration of persons afflicted with it.

* Based on the New York Rules. Printed in Bristol Health Report, 1891-2-3-4 ; reprinted 1899.

Tuberculosis is commonly produced in the lungs (which are the organs most frequently affected) by breathing air in which living germs are suspended as dust.

It may also be contracted by the use of meat or milk from tuberculous animals.

The material which is coughed up, sometimes in large quantities, by persons suffering from Consumption, contains these germs often in enormous numbers.

This material when expectorated frequently lodges in places where it dries, as in the streets, on floors, carpets, handkerchiefs, &c. After drying in one way or another it is very apt to become pulverised and float in the air as dust. By observing the following rules the danger of catching the disease will be reduced to a minimum :—

- 1.—Do not permit persons suspected to have Consumption to spit on the floor, or on clothes, unless the latter be immediately burnt. The spittle of persons suspected to have Consumption should be caught in earthen or glass dishes containing the following solution :—

Corrosive sublimate	...	...	...	1 part.
Water	...	...	...	1,000 parts.

- 2.—Do not sleep in a room occupied by a person suspected of having Consumption. The living rooms of consumptive patients should have as little furniture as practicable—hangings should be especially avoided. The use of carpets, rugs, &c, ought always to be avoided.
- 3.—Do not fail to wash thoroughly the eating utensils of a person suspected of having Consumption, as soon after eating as possible, using boiling water for the purpose.
- 4.—Do not mingle the unwashed clothing of consumptive patients with similar clothing of other persons.

- 5.—Do not fail to catch the bowel discharges of consumptive patients with diarrhœa, in a vessel containing Corrosive sublimate 1 part, water 1,000 parts.
- 6.—Do not fail to consult the family physician concerning the social relations of persons suffering from suspected Consumption.
- 7.—Do not permit mothers suspected of Consumption to nurse their offspring.
- 8.—Household pets (animals or birds) are quite susceptible to Tuberculosis; therefore do not expose them to persons affected with Consumption; also do not keep, but destroy at once, all household pets suspected of having Consumption, otherwise they may give it to human beings.
- 9.—Do not fail to cleanse thoroughly the floors, walls, and ceilings of the living and sleeping rooms of persons suffering from Consumption, at least once in two weeks.
- 10.—It is necessary to boil all cow's milk before use especially by children, as it is practically certain that consumption in children is frequently caused by use of raw milk from Tuberculous cows.
- 11.—The lungs should be protected from injury such as arises from damp and over-crowded dwellings, and from dusty occupations.
- 12.—The frequenting of public assemblies by person, suffering from Consumption is not advisable.
- 13.—Disinfection should be thoroughly and completely carried out in every house where a death from Consumption has occurred.

D. S. DAVIES, M.D.,

Medical Officer of Health

Table B. Showing population, Births, Marriages, and Deaths, and Birth and Death Rates, in Bristol, for the 22 Years, 1877-1898. (All figures revised on 1891 Census.)

	Estimated Population.	Registered Births.	*Marriages in the District of the Bristol Union.	DEATHS.				ANNUAL RATES.				
				Total Deaths at all Ages.	Under 1 Year.	Over 1 and under 5.	Over 60.	In Public Institutions.	Birth Rate per 1000.	Death Rate per 1000.	Infantile Mortality to 1000 Births.	Zymotic Rate.
1877	197,395	7,295	1,199	4,415	1,120	785	990	653	36.9	22.3	153.5	3.3
1878	199,879	7,236	1,159	4,409	1,145	605	1,121	631	36.2	22.0	158.2	2.0
1879	202,400	7,644	1,115	4,496	1,112	715	1,163	607	37.7	22.2	145.4	2.2
1880	204,942	7,193	1,195	4,276	1,040	759	1,036	661	35.1	20.8	144.5	3.0
1881	207,229	7,121	1,103	4,050	900	608	1,084	650	33.8	19.5	126.3	2.2
1882	208,007	6,935	1,107	4,019	988	589	1,045	624	33.3	19.3	142.0	2.3
1883	209,522	6,844	1,073	3,795	917	405	1,057	608	32.6	18.1	133.9	1.1
1884	211,048	6,888	1,090	4,023	1,001	538	1,061	653	32.6	19.0	145.3	1.8
1885	212,586	6,786	974	4,281	1,052	639	1,134	629	31.9	20.1	155.0	2.2
1886	214,134	6,724	949	4,253	1,002	619	1,132	694	31.4	19.8	149.1	2.2
1887	215,694	6,619	956	4,542	996	796	1,244	680	30.6	21.0	150.4	3.0
1888	217,266	6,608	981	3,816	824	432	1,138	710	30.4	17.5	124.6	1.3
1889	218,848	6,694	932	4,021	976	595	1,062	660	30.5	18.3	145.8	2.2
1890	220,442	6,634	1,033	4,532	991	597	1,265	730	30.0	20.5	149.4	2.1
1891	222,049	6,725	937	4,631	972	603	1,371	815	30.3	20.8	144.5	1.7
1892	223,592	6,563	973	4,331	953	634	1,197	776	29.3	19.3	145.2	2.0
1893	225,028	6,788	955	4,241	959	411	1,283	851	30.1	18.8	141.2	1.6
1894	226,578	6,393	920	3,888	848	524	1,077	769	28.8	17.1	148.3	2.0
1895	228,139	6,622	846	4,108	935	414	1,321	837	29.0	18.0	141.1	1.1
1896	230,626	6,537	863	3,960	908	476	1,130	793	27.8	16.8	138.9	1.8
1897	232,242	6,514	884	3,988	949	434	1,195	821	28.0	17.1	145.6	1.8

1898 | 316,900 | 9,061 | 837 | 5,441 | 1,491 | 795 | 1,455 | 881 | 28.5 | 17.1 | 164.5 | 2.6

* This includes the Registration Sub-Districts of St. Mary Redcliff, Castle Precincts, St. Paul, St. James, and St. Augustine only.

Table C. Showing Number of Deaths from Zymotic Diseases in Bristol, during the 23 years, 1876—1898.

	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898.
Small Pox ...	23	...	...	...	1	...	...	...	...	10	8	13	26	...	...	1†	...	20‡	16 ×	...	5	1	...
Diphtheria ...	11	4	5	4	6	10	8	13	19	25	28	23	26	15	16	16	38	53	50	34	38	36	44
Erysipelas ..	14	17	12	13	10	18	14	10	11	10	11	10	21	16	9	12	21	11	8	16	10	5	6
Scarlet Fever ...	286	45	36	92	244	153	75	33	37	21	89	217	45	26	40	37	47	35	16	16	59	18	14
Typhus ...	5	31	2	...	...	7	10	1	2	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Enteric Fever ...	84	101	89	42	39	52	38	29	40	16	29	23	28	38	33	23	18	26	21	22	20	47	26
Puerperal Fever* ...	..	...	...	...	...	...	...	..	18	12	8	9	17	11	12	7	25	16	11	8	8	6	11
Measles ...	77	133	53	74	73	120	54	33	46	159	101	147	61	185	92	239	105	25	116	8	143	57	309
Whooping Cough ...	47	239	66	174	95	38	196	38	99	149	101	124	38	105	201	53	154	80	177	45	64	118	110
Diarrhœa...	209	117	171	70	184	82	104	83	132	89	119	117	68	131	96	58	99	125	65	143	106	153	348

* Previous to 1884, Puerperal Fever was not separated in the Local returns from Puerperal Diseases generally.

† This death occurred in the Nover's Hill Hospital outside the City, and so did not appear in the General Returns.

‡ Of these deaths one occurred in the Nover's Hill Hospital, outside the City, and so did not appear in the General Returns.

× Of these deaths five occurred in the Nover's Hill Hospital, outside the City, and so did not appear in the General Returns.

D.

City of Bristol.

TABLE SHOWING DEATHS FROM SPECIFIED CAUSES AT ALL AGES
AND AT SIX GROUPS OF AGES, DURING THE YEAR 1898.

Classes.	Causes of Death.	Deaths at certain Age Groups.						All Ages.			Rate per 1000 Living.
		0 to 1	1 to 5	5 to 15	15 to 25	25 to 60	60 up- wards.	M.	F.	Total.	
	ALL CAUSES	1491	795	187	235	1278	1455	2787	2654	5441	17·17
I.	Small Pox { Vaccinated ... ..	...	...	...	...	...	...	...	...	...
	Un-Vaccinated ... ..	...	...	...	...	...	...	...	...	...
	No Statement ... ..	...	...	...	...	...	...	...	...	...
	Scarlet Fever	1	7	6	...	...	...	8	6	14	0·04
	Diphtheria	1	25	13	...	...	...	23	16	39	0·12
	Membranous Croup ... ..	...	5	...	...	...	...	4	1	5	0·01
	Enteric or Typhoid Fever ... ..	...	2	3	9	8	4	15	11	26	0·03
	Continued Fever, Ill-defined Fever ... ..	...	...	...	...	...	...	...	...	...
	Relapsing Fever ... ..	...	...	...	...	...	...	...	...	...
	Puerperal Fever ... ..	...	...	...	3	8	...	...	11	11	0·03
	Cholera (Asiatic) ... ..	...	...	...	...	...	...	...	...	...
	Erysipelas	1	...	...	1	2	2	3	3	6	0·01
	Measles	71	223	14	...	1	...	171	138	309	0·97
	Whooping Cough	53	55	2	...	...	...	50	60	110	0·34
	Influenza	5	6	...	4	21	21	25	32	57	0·17
	Simple Cholera, Chol: Diarrhœa ... ..	...	...	...	...	...	...	...	...	...
	Diarrhœa, Dysentery	253	74	2	1	7	11	189	159	348	1·09
	Venereal Affections	19	...	...	3	1	1	12	12	24	0·07
	Pyæmia ... ..	...	...	...	...	...	...	...	...	...
	Cow Pox, Effects of Vaccination ... ..	...	...	...	...	...	...	...	...	...
II.	Tetanus	2	1	...	...	2	...	4	1	5	0·01
	Other Spec: Feb, or Zymotic Disease	2	1	...	1	1	...	3	2	5	0 01
III.	Parasitic Diseases	1	...	...	...	...	...	...	1	1	0 002
III.	Dietic Diseases, Alcoholism ... ..	...	...	...	...	4	1	2	3	5	0·01
IV.	Rheumatic Fever ... ..	...	...	2	...	4	...	4	2	6	0 76
	Rickets	4	5	1	...	...	...	5	5	10	
	Cancer, Malignant Disease ... ..	...	1	1	3	108	130	90	153	243	
	Tabes Mesenterica	17	6	2	...	...	...	15	10	25	
	Tubercular Meningitis, Hydrocephalus	24	32	10	3	2	...	35	36	71	1·24
	Phthisis Pulmonalis	9	7	8	75	274	20	229	164	393	
	Scrofula, Tuberculosis	20	25	8	7	19	3	53	29	82	
	Other Constitutional Diseases	4	3	7	7	25	17	35	28	63	
V.	Premature Birth	197	...	...	...	...	...	109	88	197	0 50
	Congenital Malformations	22	2	...	...	...	...	12	12	24	
	Old Age ... ..	...	...	...	...	...	161	65	96	161	
VI.	Inflam: of Brain and Membranes	9	14	5	3	9	5	26	19	45	2·00
	Apoplexy, Paralysis	2	5	4	4	91	226	153	179	332	
	Epilepsy	4	...	...	2	8	1	8	7	15	
	Convulsions	169	26	2	...	1	...	113	85	198	
	Other Diseases of Nervous System	3	4	3	2	16	18	20	26	46	
	Diseases of Heart and Circulation	6	5	11	30	208	243	227	276	503	1·58
	Croup ... ..	...	1	...	...	...	...	...	1	1	3 17
	Bronchitis	119	81	2	2	85	298	282	305	587	
	Pneumonia	80	103	12	9	74	56	182	152	334	
	Other Respiratory Diseases	7	9	2	4	25	37	41	43	84	
	Dentition	22	10	...	...	...	...	22	10	32	
	Dis: of Stomach and Intestines, Peritonitis	111	27	10	13	54	50	127	138	265	1·18
	Cirrhosis and other Dis: of Liver	4	...	...	...	34	12	16	34	50	
	Other Diseases of Digestive System	13	2	2	2	6	3	13	15	28	
	Diseases of Urinary Organs	5	7	1	8	77	69	96	71	167	
	Diseases of Reproductive Organs ... ..	...	...	3	1	15	2	2	19	21	
	Other Local Diseases	16	2	25	20	23	23	48	61	109	0·52
VII.	Accident, Negligence	12	19	25	13	44	32	101	44	145	0·55
	Suffocation	6	...	...	...	2	...	2	6	8	
	Homicide ... ..	...	...	...	...	1	...	...	1	1	
	Suicide ... ..	...	...	...	4	13	5	20	2	22	
	Execution ... ..	...	...	...	...	...	...	...	...	...
VIII.	Marasmus, Atrophy, Debility	170	...	...	...	...	2	103	69	172	0·65
	Other Ill-defined Causes	27	...	1	1	5	2	24	12	36	

Infectious Disease (Notification Act,) 1889.**1898** Notifications received during each Quarter of 1898.**Table a.** (UNCORRECTED, AS RECEIVED)

NOTIFIABLE DISEASE	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	Totals of each disease
Small Pox	1	...	1	...	2
Choleraic Diarrhœa ...	...	...	2	...	2
Diphtheria	81	41	48	45	215
Membranous Croup ...	3	4	1	2	10
Erysipelas	63	61	51	88	263
Scarlet Fever or Scar- latina	120	83	68	137	408
Typhus Fever ...	...	...	...	...	...
Enteric or Typhoid Fever	34	12	29	38	113
Relapsing Fever ...	...	...	...	...	...
Continued Fever ...	...	...	...	...	...
Puerperal Fever ...	7	5	2	4	18
Totals in each Quarter	309	206	204	314	1,033

Table β. Notification and Deaths registered by Sub-Districts during the year 1898.
(CORRECTED.)

	Small Pox.		Choleraic, Diarrhoea.		Diphtheria,		Membranous Group.		Erysipelas.		Scarlet Fever		TYPHUS.		ENTERIC TYPHOID		Relapsing.		Continued		PUERPERAL.		Total cases in each Sub-District.
	Cases	Deaths.	Cases	Deaths.	Cases	Deaths.	Cases	Deaths.	Cases	Deaths.	Cases	Deaths.			Cases	Deaths.			Cases	Deaths.	Cases	Deaths.	
St. Mary Redcliff ...					20	1	1		7		19	1			3						1		50
St. Paul ...					10	7			16		24				5								56
St. Augustine ...					4	1			21		11				10	2					1	1	47
Bedminster ...			2		56	7	7	3	53	2	100	8			27	7					4	4	249
Clifton ...					34	3	3	1	29	1	38				14	4					3	2	118
Ashley ...					36	7	7		17		40				15	5							108
St. George ...					23	7	2	1	51		55	2			10						3	1	144
St. Philip ...	1				18	4			43	1	66	3			22	4					2	1	152
Stapleton ...					5	1			9		15				2	1					3	1	34
Admitted to Public Insts. from outside of Borough	1				1	1			3		5				2	1						1	12
Extra Municipal Insts. ...									14	2	9				3	2					1		27
Total cases of each disease	2		2		207		10		263		382				113						18		997
Total deaths from each disease ...						39		5		6		14			26							11	
Percentage of deaths to known cases ...	1.0				18.8		50.0		2.8		3.6				23.0						61.1		

This Table has been corrected as follows:—

Eight cases notified as Diphtheria, and twenty-six notified as Scarlet Fever proved subsequently not to be cases of those diseases, and have been deducted. The patient in Clifton who died from Membranous Croup was notified as suffering from Diphtheria, the terms in this case being apparently used as synonymous.

Table γ.

NOTIFICATION.

Particulars as to removal and Disinfection in all Cases Notified during the Year 1898.

	Small Pox.	Cholerae. Diarrhoea.	Diphtheria.	Membranous Group.	Erysipelas.	Scarlatina or Scarlet Fever.	The Fevers known by the following names:—					TOTALS
							Typhus.	Typhoid Enteric.	Relapsing	Continued	Puerperal	
Cases treated in General Hospital, Infirmary, or Children's Hospital ...	...	...	39†	2	19‡	3	..	55‡	...	..	2	120
Cases treated in Sanitary Authority's Hospitals	2*	...	2	...	...	§170	..	1	...	..	...	175
Cases treated in Guardians Hospital...	...	...	...	...	11	14	..	6	...	..	...	31
Total treated at Home... ..	...	2	166	8	233	195	..	51	...	...	16	671
Total cases known or notified ...	2	2	207	10	263	382	0	113	0	0	18	997
Cases in which disinfection of bedding, clothing, and rooms has been carried out, and necessary precautions taken under the supervision of District Inspector	2	2	199	10	4	376	...	113	...	...	17	723
Cases in which disinfection was carried out to the satisfaction of Medical Attendant or in which Disinfection was unnecessary ... ..	...	...	8	...	259	6	..	...	...	...	1	274

* One case was admitted from outside the Borough.

† One case admitted from outside the Borough.

‡ Three cases admitted from outside the Borough.

§ Five Cases admitted from outside Borough.

|| Two Cases admitted from outside Borough.

NOTIFICATION.

Table δ.— Showing the number of cases of Infectious Disease notified under the Infectious Disease Notification Act, 1889, since its adoption in 1890.

	1890	1891	1892	1893	1894	1895	1896	1897	1898
Small Pox	0	16	0	165	201	4	42	10	2
Diphtheria and Membranous Croup	56	70	106	141	128	165	258	205	220
Erysipelas	105	135	196	230	154	195	246	203	263
Scarlet Fever ...	559	888	1442	1245	485	562	1352	511	382
Typhus	1	0	0	0	0	0	0	0	0
Enteric Fever ...	122	117	135	122	90	89	110	350	113
Continued or Doubtful Fever ...	6	8	3	6	1	1	2	0	0
Puerperal Fever ...	11	11	34	30	18	16	21	10	18

Bristol City Hospitals.

MEDICAL ATTENDANT'S REPORT FOR THE STATISTICAL
YEAR, ENDING DECEMBER 31ST, 1898.

The Novers Hill Hospital—Scarlet Fever.

Remaining from 1897	46	} ... 216
Admitted	...	...	170
Discharged cured	173	} ... 216
* Died	...	...	4
Remaining	...	...	39

Clift House Temporary Hospital.

Remaining (Typhoid) from 1897	...	2	} ... 6
Admitted (Measles)	...	2	
„ (Diphtheria)	...	2	
All discharged cured			

St. Philip's Marsh Probationary Hospital.†

Remaining from 1897	0	} ... 2
Admitted (Small-pox)	...	...	1
„ (probationary for Typhus)	...	...	1

An unusually large number of cases (25) were admitted to the Novers Hill Hospital on notification as Scarlet Fever, which subsequently proved not to be suffering from that disease, and 11 contracted the disease in Hospital.

* One of those was moribund on admission.

† The Small-pox case was transferred convalescent to the Hospital Ship. The other died—A Post-mortem revealed Serous Apoplexy (internal).

This uncertainty in diagnosis shows the necessity for isolation wards, where doubtful cases on admission may be received for observation.

In 1897, only 8 cases admitted proved not to be Scarlet Fever.

Complications and sequelæ of patients admitted during the year :—

Albuminuria 14	Otorrhœa 9
Conjunctivitis ... 1	Pneumonia 1
Convulsions with Coma	Rheumatism 2
(recovery) 1	Rhinitis 6
Eczema 1	Return cases 4
Erysipelas 1	Relapses or Secondary
Herpes Facialis ... 2	Rash 5
Laryngitis 1	Tinea Tarsi 1
Glandular Abscesses ... 8	Whooping Cough on
Measles 1	admission 2

G. C. PAULI, M.R.C.S., L.R.C.P.,

Medical Attendant.

COMPARATIVE TABLE—Showing the Estimated Population, Density, Birth-rate, Death-rate, Zymotic-rate, Fever Death Rate, Diarrhoea Death Rate, and Infantile Death Rate of the 14 LARGEST TOWNS OF ENGLAND AND WALES (those having a population of over 200,000); also of EDINBURGH, GLASGOW, DUBLIN, and CARDIFF, for the Year 1898, compared with the same particulars and rates for the group of 33 large towns. *From the Registrar General's Return.*

33 Large Towns	Estimated Population, middle of 1898.*	Persons to an acre.	Birth-rate.	Death-rate.	Zymotic rate.	Fever Death-rate.	Diarrhoea Death-rate.	Deaths under 1 year to 1000 Births.
London ...	11,218,378	35.3	30.3	19.0	2.85	0.20	1.22	178
Liverpool ...	4,504,766	60.3	29.5	18.7	2.78	0.13	0.97	167
Manchester ...	633,645	47.9	35.2	24.0	3.22	0.26	1.54	184
Birmingham ...	539,079	41.8	32.7	21.9	3.11	0.23	1.84	197
Leeds ...	510,343	40.2	34.0	20.0	2.78	0.22	1.36	191
Sheffield...	416,618	19.3	31.2	19.2	3.12	0.22	1.05	185
Bristol	356,478	18.1	33.9	20.2	3.82	0.40	1.89	195
West Ham	316,900	27.1	28.6	17.2	2.69	0.08	1.10	164
Nottingham	286,654	60.9	30.6	15.4	2.68	0.25	0.98	170
Bradford	236,137	21.5	28.9	17.7	2.37	0.24	1.20	178
Hull ...	233,737	21.7	24.0	17.6	2.12	0.21	1.05	185
Newcastle	229,887	25.6	33.4	18.4	2.99	0.25	1.85	182
Salford ...	223,021	41.5	31.7	21.4	2.84	0.30	1.10	190
Leicester	215,702	41.7	34.7	22.7	4.03	0.37	2.16	212
Edinburgh	208,662	24.3	29.6	16.9	3.25	0.14	1.58	191
Glasgow...	295,628	38.7	27.5	19.7	2.33	0.13	0.84	140
Dublin ...	724,349	59.4	33.6	21.2	3.58	0.32	1.15	156
Cardiff ...	349,594	14.2	31.2	26.8	2.44	0.53	1.00	174
	177,770	29.3	31.1	14.8	2.24	0.10	0.84	158

* These Populations are based on the 1891 Census returns. † Average of 5 years.

COMPARATIVE MORTALITY.

1898.—The Thirty-three Great Towns.

(From the Registrar-General's Annual Summary.)

The estimated population of the thirty-three great towns of England and Wales in the middle of the year 1898 was 11,218,378. The Births registered in the course of the fifty-two weeks, ending 31st December, 1898, numbered 339,350, and were in the proportion of 30·3 per 1,000 of the estimated population. The Deaths registered within the same period were 212,848 in number, and correspond to a rate of 19·0 per 1,000 of the population; this rate was 1·4 per 1,000 below the mean rate for the thirty-three great towns in the preceding ten years, and with two exceptions was below the rate recorded in any one of these years.

The general death-rates in 1898, calculated without reference either to sex or age, varied considerably in the thirty-three great towns, ranging from 13·9 in Croydon to 24·0 in Liverpool. The rate in **Bristol** was **17·2**.

Infantile Mortality.—The 212,848 deaths at all ages included 60,418 deaths of infants during their first year of life. Infantile mortality, therefore, measured by the proportion of deaths under one year to births registered, was equal to 178 per 1,000 in the thirty-three great towns, and was 11 per 1,000 above the average proportion in the ten preceding years. During the year 1898 the lowest proportions in the thirty-three towns were 150 in Croydon, 153 in Huddersfield, 156 in Portsmouth, and 158 in Cardiff; the highest proportions were 206 in Blackburn, 208 in Gateshead, 212 in Salford, and 225 in Preston. The infantile rate in **Bristol** was **164**.

Among the *principal zymotic diseases* the mortality from *diarrhœa* showed an excess in the year 1898 as compared with the mean rate in the preceding decennium; the mortality from *diphtheria* and from “*fever*” corresponded with the average; while that from *small-pox*, *measles*, *scarlet fever*, and *whooping-cough* was below the average.

There were in the thirty-three towns 13 deaths from *small-pox* last year, as compared with 732, 450, 120, 25, and 18 respectively, in the five preceding years. Of these 13 deaths, 3 occurred in Gateshead, 3 in Newcastle-upon-Tyne, 2 in Liverpool, 2 in Leeds, 2 in Sunderland, and 1 in London. No death was returned from *smallpox* in **Bristol** during the year.

The mortality attributed to *measles* was equal to a rate of 0·56 per 1,000, as against an average rate of 0·59 in the ten preceding years. The lowest rates were 0·02 in Preston, 0·07 in Burnley, 0·22 in Wolverhampton, and 0·25 in Bolton; the highest rates were 0·73 in Halifax, 0·87 in Swansea, **0·97 in Bristol**, and 1·03 in Leicester.

Scarlet Fever caused a mortality equal to 0·14 per 1,000, as compared with a decennial average of 0·25. The rates in the several towns ranged from 0·03 in Preston, **0·04** in Plymouth and in **Bristol**, and 0·05 in Cardiff, in Burnley, and in Bradford, to 0·23 in Liverpool, 0·26 in Wolverhampton, 0·28 in Birkenhead, and 0·29 in Salford and in Leeds.

The mortality ascribed to *diphtheria* was equal to a rate of 0·31 per 1,000, and corresponded with the decennial average. Excluding London, where the rate was equal to 0·39 per 1,000, the rate in the great English towns averaged 0·25 per 1,000; it ranged from 0·06 in Sunderland, 0·07 in Bolton, in Oldham, in Preston, in Bradford, and in Hull, and 0·08 in Halifax, to 0·43 in Wolverhampton and in Birkenhead, 0·54 in Leeds, 0·63 in West Ham, 0·73 in Cardiff, and 1·22 in Swansea. The rate in **Bristol** was **0·14**.

Whooping Cough gave rise to a death-rate of 0·42 per 1,000 during the year, or 0·10 below the average rate. The lowest rates were 0·04 in Blackburn, 0·06 in Burnley, 0·07 in Birkenhead, 0·09 in Leicester, and 0·10 in Wolverhampton; the highest rates being 0·53 in Preston, 0·60 in Salford, 0·62 in Sheffield and in Newcastle-upon-Tyne, and 0·64 in Gateshead. The rate in **Bristol** was **0·36**.

Continued Fevers, mainly *enteric*, gave rise to a mortality equal to a rate of 0·20 per 1,000, which corresponded with the average. The lowest rates were 0·06 in Plymouth, **0·08** in **Bristol**, 0·09 in Croydon, and 0·10 in Cardiff and in Huddersfield; the highest rates being 0·34 in Birkenhead, 0·37 in Salford and in Preston, 0·40 in Norwich and in Sheffield, and 0·48 in Sunderland.

Diarrhœa caused a mortality equal to a rate of 1·22 per 1,000; this rate was 0·36 above the decennial average, and with two exceptions was higher than it had been in any of the ten preceding years. The lowest rates were 0·49 in Swansea, 0·64 in Halifax, 0·76 in Oldham, 0·84 in Cardiff, and 0·86 in Portsmouth and in Huddersfield; the highest rates were 1·89 in Sheffield, 1·95 in Wolverhampton, 2·05 in Preston, and 2·16 in Salford. The rate in **Bristol** was **1·10**.

The highest aggregate rates from the principal Zymotic diseases were 3·35 in Leicester, 3·69 in Sunderland, 3·82 in Sheffield, and 4·03 in Salford. The general Zymotic rate in **Bristol** was **2·69**.

Uncertified causes of death.—Of the 212,848 deaths registered during the year, 2,538, or 1·2 per cent., were not certified. In London the proportion of uncertified deaths did not exceed 0·6 per cent., whilst it averaged 1·6 in the thirty-two other great towns. The causes of all the deaths in Croydon and in Derby during the year 1898 were certified. Among the other great towns the lowest proportions of uncertified deaths were 0·1 in Oldham, 0·3 in

Bolton and in Gateshead, and 0·4 in Leeds; the highest proportions were 2·7 in Halifax, 2·9 in Birmingham and in Preston, 3·3 in Blackburn, and 3·4 in Liverpool. The proportion of uncertified deaths in **Bristol** was **0·7**.

The Sixty-seven other Large Towns.

In the middle of the year 1898 these sixty-seven English and Welsh towns contained a population estimated at 3,911,807. The Births registered in these towns in the course of the year numbered 115,138, and were in the proportion of 29·4 per 1,000 of the population against 30·1 in each of the two preceding years. The Deaths registered in the course of the year were 67,162 in number, and corresponded to a rate of 17·2 per 1,000 persons living, against 17·3 and 17·2, respectively, in the two preceding years.

Infantile Mortality.—The 67,162 deaths at all ages registered in the sixty-seven towns, included 19,954 of children under one year of age. Infantile mortality, or the proportion of deaths under one year of age to registered births, was therefore equal to 173 per 1,000.

Small-pox caused 203 deaths in these sixty-seven towns during the year under notice; of which 199 were registered in Middlesborough, and one each in Bootle, York, Darlington, and West Hartlepool.

The death-rate from *measles* in these towns averaged 0·41 per 1,000: the highest rates being 0·76 in Ipswich, 0·86 in Cambridge, 0·95 in Newport, 1·03 in Hanley, 1·20 in Barrow-in-Furness, 1·46 in Carlisle, and 2·89 in Dudley.

The death-rate from *scarlet fever* averaged 0·10 per 1,000; the highest rates in the several towns being 0·23 in Great Yarmouth, 0·25 in Accrington and in Rotherham, 0·28 in Wallasey and in Bootle, 0·31 in St. Helens, and 0·38 in Wigan.

Diphtheria caused a death-rate averaging 0·28 per 1,000; the highest rates being 0·60 in Colchester, 0·64 in Southampton, 0·65 in Worcester, 0·72 in Great Yarmouth, 1·02 in Keighley, 1·10 in Rhondda, 1·85 in Aberdare, and 2·77 in Longton.

The death-rate from *whooping-cough* averaged 0·27 per 1,000: the highest rates being 0·55 in West Bromwich, 0·62 in Aberdare, 0·73 in South Shields, 0·78 in Colchester, 0·92 in Barnsley, and 0·99 in Jarrow.

The death-rate from "*fever*" averaged 0·21 per 1,000 during the year 1898. The highest "*fever*" rates were 0·40 in Grimsby, 0·42 in Longton, 0·50 in Barnsley, 0·61 in Bootle, 0·68 in Dudley, and 0·88 in Great Yarmouth.

The death-rate ascribed to *diarrhœa* averaged 1·09 per 1,000. The highest rates were 1·83 in Great Yarmouth, 1·90 in Ipswich, 2·11 in Barnsley, 2·25 in Dudley, 2·35 in Longton, 2·45 in Rotherham, and 3·04 in Coventry.

The death-rates from the *principal zymotic diseases* in the aggregate averaged 2·41 in the sixty-seven towns, and ranged from 0·36 in Bournemouth, 0·66 in Oxford, 0·86 in Southport, 0·95 in Bath, 1·04 in Hornsey, 1·10 in Exeter, and 1·19 in Scarborough, to 4·00 in Coventry, 4·22 in Barnsley, 4·33 in Aberdare, 4·42 in Great Yarmouth, 4·61 in Middlesbrough, 6·25 in Longton, and 6·43 in Dudley.

Edinburgh, Glasgow, and Dublin.

In Edinburgh the death-rate in 1898 was equal to 19·7 per 1,000, in Glasgow it was 21·2 per 1,000, and in Dublin it was 26·8 per 1,000, against 18·7 in London.

Colonial and Foreign Cities.

From the weekly and other returns with which the Registrar-General is favoured by the Authorities of thirty-three of the principal Colonial and Foreign Cities, with an estimated aggregate population exceeding twenty-three millions, it is found that the deaths last year in these cities, collectively, were equal to a rate of 22·2 per 1,000 living.

In thirty European and American Cities, with an aggregate population of about $21\frac{1}{2}$ millions, the rate was 20·1 per 1,000. In Paris the rate was 19·7, in Berlin it was 17·3, in Vienna it was 20·1, and in New York it was 19·1, against 18·7 in London. Among the other Cities the lowest rates were 13·8 in Cincinnati, 14·3 in St. Louis, and 16·8 in Brussels and in Christiania. The highest were 24·8 in Breslau and in New Orleans, 25·1 in Munich, 25·8 in St. Petersburg, 28·2 in Trieste, and 30·0 in Moscow.

Small-pox caused 145 deaths in Moscow, 89 in St. Petersburg, 12 in Berlin, and 11 in Florence.

Measles was most fatal in proportion to population in Paris, Rotterdam, St. Petersburg, Moscow, Hamburg, Vienna, Prague, and Buda-Pesth.

Scarlet Fever in St. Petersburg, Moscow, Prague, Buda-Pesth, and Trieste.

Diphtheria in Stockholm, St. Petersburg, Moscow, Berlin, Munich, Vienna, Prague, Trieste, New York, Philadelphia, and San Francisco.

Whooping-Cough in Amsterdam, Rotterdam, the Hague, and Copenhagen.

“*Fever*” in St. Petersburg, Moscow, Prague, Trieste, Rome, Florence, Venice, Philadelphia, and San Francisco.

Diarrhœal Diseases in Paris, Brussels, St. Petersburg, Moscow; in the German and Austrian Cities with the exception of Prague; and in Rome, Turin, Venice, and New York.

Among the Indian Cities the death-rate was equal to 27·1 in Calcutta, 44·9 in Madras, and 63·1 in Bombay.

Small-pox caused 54 deaths in Bombay, 75 in Calcutta, and 117 in Madras.

Measles caused 259 deaths in Bombay and 761 in Madras,

Under the heading “*Fever*” 3,892 deaths were classed in Calcutta, 5,503 in Madras, and 22,120 in Bombay, the latter number including 18,011 deaths from *Plague*.

The mortality from *Diarrhœal Diseases* was excessive in each of these Indian Cities.

PART 11.

Report of the Chief Inspector of Nuisances.**1898.**

PUBLIC HEALTH DEPARTMENT,

40 PRINCE STREET,

January, 1899.

To THE BRISTOL URBAN SANITARY AUTHORITY.

GENTLEMEN,

I have the honour of submitting the following Report with Summary showing the amount of work effected in this Department during the past year (the first complete year since the extension of the boundaries).

1,096 complaints and applications were received and recorded at this office, this being 11 less than last year, although the complaints have come in from the extended area of Greater Bristol, which was not so last year, except during the last 2 months of the year. These were promptly enquired into, when it was found that at 364, or 33·2 per cent. of the places complained of no Nuisance existed.

1,037 cases of Infectious Disease were notified to the Medical Officer of Health, and enquired into by the District Inspectors, and the results duly reported to the Medical Officer of Health, these enquiries necessitating 1,824 visits. 689 infected houses were disinfected, and 25,742 articles of clothing, bedding, &c., removed therefrom, disinfected by super-heated steam and returned to the houses, 110 similar articles were at the owners' request destroyed. On referring to last year's report it will be seen that Infectious Disease has been much less prevalent in the City during the year 1898 than it was in 1897.

The Informal Notices served by the District and Special Inspectors have as usual been very successful, so much so that only 64 Formal or Statutory Notices were required. The prosecutions for non-compliance with these notices were also gratifyingly small, full particulars of which are appended.

Houses Let in Lodgings numbered 414, or the same as last year, and I am pleased to say that the Annual Notices for Lime-washing and Cleansing during the month of May were so promptly complied with that no prosecutions were necessary, this is a very satisfactory result as these houses are now under the supervision of the District Inspectors and not of a Special Inspector as formerly, and in my visits to many of the houses in question taken promiscuously I cannot find that any of them have deteriorated by the change.

Dairies, Cowsheds, and Milkshops—The Dairies are now in good condition, many improvements having been made during the past year, such as lining the walls with white glazed bricks or tiles, and re-laying the floors with various kinds of impervious material, so that absolute cleanliness may be assured.

Those of the Cowsheds which were until November, 1897, outside the City boundaries have during the past year received a large amount of attention, and their condition has been largely improved by the enforcement of improved drainage, ventilation, air space, and water supply. Many of the Cow-sheds in the newly added area were found to be drained into Cesspools or the nearest ditch, which also received the drainage from Water Closets and house Sinks, in one case an open Cesspool was found, and this was emptied by means of a dipper and the contents thrown over a garden which was also close to the well. I need hardly say all this has been altered. One Cow Shed with only room space for 2 cows, was found to be occupied by 10 cows, 1 pony, and several pigs, a clearance of these was speedily effected.

The Milk Shops have also received the usual attention, in one case where milk was sold in very small quantities to poor people it was found that the same shop was used for

the sale of coal, briquettes, salt fish, second-hand clothes, &c., they also manufactured and sold ice cream the sale of which and milk was at once stopped, and in many other cases the occupiers of shops have given up the sale of milk rather than comply with the regulations.

A reference to the Summary of work hereto appended will show at a glance what has been accomplished.

Factory and Workshops Acts—The work in connection with these Acts has, as I anticipated last year, been largely increased, I am however glad to say that the two Inspectors, although new to the work, have with the assistance and advice of the Medical Officer of Health and myself so conducted the work that no friction has arisen anywhere, and also to the satisfaction of H. M. Inspectors of Factories, many of the Workshops in the newly added districts were found to be in a sadly neglected condition. A reference to the appended summary of work will show what has been effected in this direction, there is however still room for further improvements.

Slaughter Houses have received more attention than usual during the past year, the appointment of an additional Inspector has enabled this to be done as well as increasing the supervision of Butchers' Shops, Fish Shops, &c. The Slaughter Houses in the out-lying districts recently added to Bristol were found to be in a very similar condition to those in the old City. The City Slaughter Houses now number 122, and during the year 3 old licenses have lapsed and been struck off the register, and 2 new licences granted for one year only, these are renewable annually. It can however be easily imagined that it is quite impossible for 2 Inspectors to exercise that necessary supervision over 122 Slaughter Houses scattered over such a large area, so essential for the prevention of slaughtering diseased or unsound animals. A reference to the list of prosecutions hereto appended will show that the Inspectors have not been idle in this direction, there having been 6 prosecutions and penalties inflicted amounting to £28, and one Defendant was sentenced to a month's imprisonment without the option of a fine.

I long for the advent of Public Abattoirs and more efficient supervision at the time of Slaughtering.

The following is the number of Cattle, Meat, Fish, Fruit, and Vegetables destroyed during the year as unfit for food, viz. :—

	The carcasses of	19	Beasts.
	„	29	Sheep.
	„	52	Pigs.
	„	4	Calves.
18 cwt. and 16 lbs.	of Meat of various kinds from Butchers' shops.		
474	Packages of Fish.		
200	„		Vegetables.
225	„		Fruit.
7	Tons of Hams.		
16	Cases of Kidneys and Livers.		
20	Rabbits		
7	Head of Poultry, and		
37	Bags of Yeast.		

Greater Bristol having been an accomplished fact for more than a year, a very good idea may be formed of the nature of the necessary reforms required in various Sanitary matters connected with this department in the newly added areas, such as new drains laid and connected to the public sewers and doing away with cesspools wherever possible, and where not possible the enforcement of properly constructed cesspools, improved privies, &c., the closing of polluted wells, and the provision of supplies of pure water, and the removal of pig styes and offensive deposits from the proximity of dwelling houses. Whilst much good work has been done during the past year in the direction indicated above, there is still much to be done, particularly amongst the scattered homes in the older inhabited parts of the out-lying districts. I am very pleased to be able to say that the visits of the Sanitary Inspectors have been generally met in the most cordial and friendly manner, and not infrequently welcomed by the inhabitants of those districts, the owners of property too have with very few exceptions so far carried out all requirements in a very prompt and satisfactory manner.

Housing of the Working Classes Act, 1890—

During the year 9 houses have been reported as unfit for human habitation and dealt with under this Act, of these 4 were closed under an order of the Justices, 3 without such order. One has been made habitable and re-occupied, and one is now being made fit for habitation. I am glad to say that the courts and such like places in the central parts of the city are being slowly but surely swept away by the extension of business premises.

Common Lodging Houses now number 40, or 2 less than last year.

Inspector Dimond has with his usual energy given these houses a large amount of attention to see that the Bye-Laws are complied with, and the sanitary conveniencies kept in proper order, but as some of the houses are very old and ill adapted for such purpose it is difficult to attain a high standard, but the general conditions are fairly satisfactory.

Only 4 cases of Infectious Disease were notified from these houses to the Medical Officer of Health during the year, and these were so promptly dealt with by the Inspector that there was no re-current case from any of them, a fact which speaks for itself as to the efficiency of the supervision over these houses, when it is considered that the people using them consist of workers of various kinds, such as dock labourers, porters, and occasionally mechanics travelling in search of work, and non-workers such as tramps and loafers of every description, hawkers of all classes and various others, particulars of the accommodation afforded by these houses are appended.

I have to thank the members of the Health Committee for giving me the opportunity of attending the Conference of Sanitary Inspectors at Newcastle-upon-Tyne in August last, where some valuable papers were read and the discussions thereon were extremely interesting. It is at such gatherings as these, where Sanitary Inspectors from all parts

of the country meet, and by a mutual interchange of ideas and experiences that one's knowledge of Sanitary matters generally is so largely improved.

My thanks are also due and are hereby tendered to the City Engineer and his staff of Assistants for much valuable information and help.

I am, Gentlemen,

Your obedient servant,

JAMES W. KIRLEY,

Chief Inspector of Nuisances.

Summary of Nuisances abated and work done by, and under the Supervision of the Inspectors in the Health Department during the year 1898.

Prepared by the Chief Inspector of Nuisances.

NATURE OF WORK.	By District Inspectors.	By Inspector of Dairies, &c.	By Inspectors of Workshops &c.	By Inspectors of Slaughter Houses, &c.	By Inspector of Common Lodging Houses.	By Inspector of Bake Houses.	TOTALS.
Visits and Re-visits	34060	2466	4943	15720	195	1080	58464
Drains entirely relaid, &c.	588	29	66	4	2	18	707
Do. partially relaid	953	19	120	5		18	1115
W.C.'s fitted with new pans, &c.	1300	34	216	7	2	22	1581
Do. cleansed and amended	222	12	74				308
Do. fitted with flushing appliances ..	249	9	85	2			345
Additional W.C. accommodation provided	13		36				49
Dilapidated Houses repaired, &c.	362				3	30	395
Defective Roofs repaired	207	4	18				229
Sinks and Yard Gullies trapped	2268	45	318	19	2	46	2698
Yards paved by Owners	933	42	80	2			1057
Cesspools abolished	106	1					107
Offensive Deposits removed	334	56	18	21			429
Keeping of Pigs, &c., prohibited	152			1			153
Smoke Nuisances abated	6					2	8
Offensive Trades do.	15					2	17
Polluted Wells closed	44	2					46
Company's Water provided to houses ..	141	3	3			4	151
Nuisances from overcrowding abated ..	32		5				37
Dairies, &c., Cleansed and Improved ...		120					120
Workrooms and Passages, limewashed, &c.			123				123
Do. better ventilation secured			31			1	32
Rooms at Tenement Houses limewashed, &c.	1376						1376
Passages and Stairs at do. do.	326						326
Slaughter Houses limewashed				24			24
Do. Paving repaired				20			20
Limewashing, &c., secured					82	99	181
Other Nuisances abated	422	42	10	6		4	484
Totals	10049	418	1203	111	91	246	12118

No. of Complaints received and attended to	...	...	...	1096
„ Offensive trades visited	...	...	...	112
„ Smoke observations taken	...	...	...	186
„ Times smoke test applied to drains	...	...	...	1903
„ Visits to houses <i>re</i> infectious disease	...	...	...	1824
„ Houses disinfected after such disease	...	...	...	689
„ Articles of Bedding, &c., removed and disinfected	...	...	...	25742
„ Do. Do. and burnt	...	...	...	110
Total number of Articles dealt with	...	...	...	25852
No. of Notices served informal	...	...	...	2349
„ „ „ formal	...	...	...	64
Half-yearly Cleansing Notices served Common Lodging Houses	...	...	...	157
Annual „ „ „ Tenement Houses	...	...	...	411

No. of Slaughter-houses on Register	...	...	...	122
„ Common Lodging Houses 40 (containing 211 rooms, certified to accommodate 1027. The rooms contain 833 single beds for men, 24 single beds for women, and 67 double beds separated)	...	...	...	40
„ Dairies, Cowsheds and Milkshops	...	—	...	1300
„ Houses let in Lodgings	...	...	...	414
„ Workshops	...	...	...	1123
„ Bakehouses	...	...	...	426

J. W. KIRLEY,
Chief Inspector of Nuisances.

**Summary of Work effected in the Health Department during
Twelve Years—1887-98.**

Prepared by the Chief Inspector of Nuisances.

TABLE SHOWING THE NUMBER OF NUISANCES ABATED AND OTHER
WORK DONE IN EACH YEAR SINCE 1887.

	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898
Number of Nuisances abated	3101	3139	3672	5600	5101	7485	8403	7564	7366	8800	8049	12118
Polluted Wells closed	17	18	48	35	14	14	26	27	32	14	14	46
Houses supplied with Co.'s Water ...	29	36	113	68	24	37	223	79	85	68	76	151
Houses disinfected ...	541	403	264	558	879	1351	1815	931	651	1389	855	682
Articles of bedding, &c., disinfected ...	19563	23233	14462	20523	31112	36722	46959	36274	24320	49226	33847	25852

Factory and Workshops Acts, 1878, 1883, 1895.

Inspection of Bakehouses and Premises, etc.

Through the extension of the City Boundaries the number of Bakehouses on the Register has increased from 295 to 422.

In carrying out the usual supervision, 1,080 inspections and visits were made during the year, with the result that at 137 various bakehouse premises one or more defects or contraventions existed, or 3 less than in the previous year.

The total number of defects amounted to 178, particulars of which are given in annexed table.

The bulk of the contraventions consisted in non-compliance with the limewashing and general cleaning regulations.

Increase attention has been given to those places where lax attention was found to be given to the rules, and this course will be pursued, to enforce the necessity of complying with the regulations.

The other chief cause of complaint consisted of defects of drainage, or dilapidations of various kinds, as to which the newly added districts were responsible for a considerable share.

The general condition of Bakehouses continues to advance steadily, as many improvements have been made and the observance of sanitary principles is becoming more general with the majority of masters and operatives.

S. DIMOND,

Inspector of Bakehouses,

Table 1. **Table of Bakehouse Inspection for the Year.**

1898. With particulars of Condition, Contraventions, Action taken, and Results.

Total number of inspections and visits			
Number of Bakehouse premises found to be in very good or passable order and condition	...	...	...
Ditto ditto	not in satisfactory condition from one or more	...	...
of the undermentioned defects	...	...	...
Number of Revisits made in connection with Notices given, and to secure compliance with same	...	...	...
	686	137	257
	1,080	1,080	1,080

PARTICULARS OF DEFECTS AND CONTRAVENTIONS.

Total.	Nature of Defects, etc.	Total Notices.	Description of Notices Complied With.	
178	Contraventions of lime-washing regulations and general cleaning	99	Informal Notices given to abate nuisances, effect repairs, or comply with Regulations	109
	Bakehouse premises with defective drainage	36	Written Notices served and complied with	24
	Ditto with defective floors, roofs, or dilapidations	30	Notices running at end of year and since complied with	4
	Ditto with defective ventilation	1		
	Ditto Manure accumulations	2		
	Ditto Polluted wells	4		
	Closets removed on account of contiguity to bakehouses	4		
	Smoke nuisances dealt with	2		
178		178		137

A copy of the Regulations was forwarded to each Bakehouse.

S. O. DIMOND,
Inspector.

TABLE II.
Showing Defects found and remedied in each
year since Bakehouse Inspection was instituted.

YEAR.	PARTICULARS.	TOTALS.
1884	Total contraventions in respect of cleansing, lime - washing, defective drains, repairs, and defective ventilation.	342
1885	Ditto	244
1886	Ditto	96
1887	Ditto	132
1888	Ditto	69
1889	Ditto	65
1890	Ditto	89
1891	Ditto	80
1892	Ditto	71
1893	Ditto	36
1894	Ditto	57
1895	Ditto	74
1896	Ditto	51
1897	Ditto	140
1898	Ditto	178

**Particulars of Cases taken before the Justices
1898.**

DATE.	NAME.	OFFENCE.	RESULT.
Feb. 11th	J. Dunn	For exposing for sale a quantity of Rotten Figs.	Fined 40/- and costs.
Feb. 14th	F. Bolton	For exposing a quantity of Diseased Meat for sale.	Fined £20 and costs.
May 13th	J. J. Ballard	4 Houses at Church Road, St. George's Unfit for Habitation.	Ordered to close them and to pay costs.
May 13th	E. Brown	Nuisance from an un-drained House at Staple Hill Road.	Ordered to drain the house and to pay costs.
May 13th	R. J. Wright	Nuisance from an unflushed W.C. in Workshop.	Adjourned. Work then done and costs paid.
May 13th	R. J. Wright	Nuisance from a defective Drain and W.C. at a Factory.	Ditto.
May 13th	E. Pearce	For exposing for sale a quantity of unsound Fish.	Fined 40/- and costs.
May 27th	R. Sainsbury	For exposing for sale the carcase of a Diseased Calf.	One Month's Imprisonment without Option.
June 17th	C. G. Blake	For exposing a quantity of unsound Fish for sale.	Fined 40/- and costs.
July 13th	H. Daniel	Nuisance from an unflushed W.C. in a Workshop.	Ordered to abate the Nuisance and to pay costs.
Sep. 30th	M. Holder	For exposing a quantity of unsound Fish for sale.	Fined 40/- and costs.

1898.

Baths and Wash-houses.

The six establishments at
 The "Victoria," Clifton.
 The "Royal," Kingsdown.
 The Weir,
 The Mayor's Paddock, New Cut,
 Jacob's Wells,
 Rennison's,

return the following figures for the year's work :—

Year ended 25th March, 1899.	No. of Bathers. Swimming Baths.	Private Baths.	Women Washing Clothes.
"Victoria," Clifton (Baths only)	14,839	...	...
"Royal" Kingsdown (Baths only)	19,991	424	...
The Weir	40,203	46,272	29,238
The Mayor's Paddock, New Cut	33,162	32,092	21,904
Jacob's Wells (Baths only)	42,170	23,164	...
Rennison's (Swimming Bath only)	22,852	...	...
Total ...	173,217	101,952	51,142

Attendance at Corporation Gymnasium from 3rd October,
 1898 to 25th March, 1899—21,693.

Particulars supplied by Mr. KANE,
 Baths Superintendent.

The City Analyst, Mr. F. Wallis Stoddart, F.I.C., F.C.S. has kindly supplied the following returns:—

“FOOD AND DRUGS ACTS.”

SUMMARY OF RETURNS FOR 1898.

Articles.	Analysed.	Condemned.
Milk	250	29
Skimmed Milk ...	2	0
Butter	279	12
Margarine	2	0
Pepper	6	0
Lard	7	0
Sugar	11	0
Coffee	11	3
Vinegar	6	3
Mustard	4	0
Bread	2	0
Flour	4	0
Cheese	7	0
Miscellaneous ...	4	0
	595	47

The working of these Acts in the City of Bristol is now entrusted to an Inspector acting under the Watch Committee, and is not administered by the Health Committee.

PART III.

Meteorological Observations taken at Clifton College.

(230 feet above Mean Sea Level).

1898.

January. This was the warmest January experienced for at least sixteen years. The mean temperature was 44·63 degrees or 6·31 degrees higher than the average of the preceding seventeen years. The temperature of the air did not once fall as low as freezing point. And there were only four days on which the ground thermometer showed any frost

The barometer was high during the whole of the month, falling below 30 inches on only three days. The rainfall was 1·234 inches as compared with the average value of 2·370 inches.

February. The warm weather of January was continued for the first $2\frac{1}{2}$ weeks in February, the mean temperature ranging during this period from 40 to 48 degrees. On the 19th, however, there was a sudden fall with a week of frosty weather. The mean temperature of the month was 41·96 degrees or nearly 2 degrees higher than the average of 18 years. The highest temperature recorded was 56 degrees on the 1st, and the lowest in the screen, 27·4 degrees on the 19th; the lowest temperature on the ground, 25·4 degrees, being reached also on the 19th. There was frost on the ground on 12 nights.

The atmospheric pressure was very variable with two well marked depressions on the 3rd and 21st. There was a fall of snow accompanying the latter depression, which on being melted yielded an equivalent of .065 inches of rain. There were 17 rainy days though the total rainfall, 1.845 inches, was not quite up to the average 1.998 inches for the month.

The weather generally was of a very changeable type.

March. The weather of this month was generally cold and changeable, the mean temperature being 40.65 degrees or about $1\frac{1}{2}$ degrees below the normal for the month. The mean daily temperature rose about 45 degrees during 6 days from the 14th to the 19th inclusive. The highest temperature recorded was 54.3 degrees on the 23rd; the lowest in the screen 28.7 degrees on the 10th, and on the ground 27.3 degrees on the 7th. There was frost on the ground on 20 nights.

Atmospheric pressure was generally high during the two middle weeks of the month. There was a very slight rainfall, the total for the month being 1.008 inches, as compared with an average for the month of 2.204 inches. There were 8 days on which a measurable quantity of rain fell.

April. The weather of April was generally fair and dry and slightly warmer than usual, the mean temperature being 48.82 degrees or about $1\frac{1}{2}$ degrees above the normal. The daily range was as a rule large as is almost invariably the case in a dry spring, but there were no very great fluctuations in the mean daily temperature.

The highest temperature observed was 64.5 degrees on the 8th, and the lowest in the screen 31.4 degrees on the 5th, the lowest on the ground being 28.8 degrees on the same date. There was frost on the ground on 3 days only and those at the beginning of the month.

Atmospheric pressure was variable, being very low at the end of the month. There was thunder and lightning accompanied with a fall of about half an inch of rain on the morning of the 8th.

The total rainfall, 2.210 inches. was slightly in excess of the average and there was rain measured on 11 days during the second and last weeks of the month.

May. The month was colder than usual, the mean temperature being 51.96 degrees as compared with the average value of 52.69 degrees. The highest temperature recorded was 71.8 degrees on the 23rd, the lowest air temperature being 38.0 degrees on the 19th.

The total rainfall was 3.391 inches or about $1\frac{1}{2}$ inches more than usual. The number of rainy days was 19 and the greatest fall on any one day was .680 inches on the 20th. There were thunderstorms on the 22nd and 23rd.

June. This month was again somewhat colder than usual, the mean temperature being 57.58 degrees or 1.73 degrees lower than the average of 18 years. The highest temperature recorded was 75.3 degrees on the 11th, and the lowest 42.8 on the 15th.

The atmospheric pressure was generally high, falling below 30 inches during the first and last weeks of the month only. There was a deficiency of about .8 inch of rain and though there was a measurable rainfall on 13 days there was no one day with anything but a very slight rain except .445 inches on the 24th.

July. There were no great variations of temperature this month and the mean temperature 62.36 degrees was only .9 inches above the normal. The highest temperature recorded was 78.7 degrees on the 16th, the lowest 45.4 degrees on the 30th.

The atmospheric pressure was higher than usual during the whole of the month, falling slightly below 30 inches on only two days, the 22nd and 23rd. The month was (as might be expected from the high barometer) unusually dry there being only 3 days with rain and a total rainfall of only .665 inch as against an average July rainfall of 3.300 inches.

August. This month was considerably warmer than usual, the mean temperature being 63.13 degrees or 2.65 degrees above the average of the last 18 years. This was due to a period of unusually warm weather from the 12th to the 23rd. The highest temperature recorded was 82.3 degrees on the 21st and the lowest air temperature 49.5 degrees on the 8th.

The atmospheric pressure was about normal, with very slight fluctuations. A slight depression on the 5th and 6th produced a heavy fall of rain, amounting to 1.200 inches on the 6th, the fall for the 4th, 5th, and 6th amounting to 2.093 inches. There was a good deal of rain during the month with a total fall of 3.692 inches and 15 rainy days. The average August rainfall for the last 17 years is 3.212 inches. There was thunder on the 18th and on the 21st.

September. This month was much warmer and drier than usual, the mean temperature being over 70 degrees for 6 days in the beginning of the month. The mean temperature for the month was 61.83 degrees as against an average value of 57.09, thus the excess amounted to nearly 5 degrees. The mean daily temperature fell with fair regularity till the end of the month when it was about 52 degrees. The highest temperature recorded was 86.8 degrees on the 7th, and the lowest 41 degrees on the 25th.

The atmospheric pressure was high during the whole month and did not fall appreciably below 30 inches till the 27th. There were only 6 days with rain, the total fall being 1.325 inches as compared with the average of the last 17 Septembers of 3.134 inches. The greater part of this rainfall occurred on the 23rd when .833 inch fell.

October. The mean temperature for this month was 53.05 degrees or nearly 4 degrees higher than the average. The highest temperature recorded was 63.5 degrees on the 6th. and the lowest in the screen 39.3 degrees on the 13th.

The barometer pressure was high during the first 11 days, but from the 14th to the 19th there was a period of very low pressure falling as low as 28.911 on the 17th. This was accompanied by a very heavy fall of rain, the amounts measured on the 16th, 17th, and 18th being .800, 1.000 and 2.080 inches respectively, or a total for the three days of 3.880 inches, which is slightly more than the average for the month. The total rainfall was 6.167 inches, and rain fell on 19 days. In fact, from the 13th till the end of the month there were only *two* days without rain.

November. This month like the last two was warmer than usual, the mean temperature being 46.87 degrees or 2.3 degrees above the average. During the first half of the month the average temperature was just about 50 degrees, but it was much colder during the second half though the thermometer in the screen only fell below freezing point on the 28th and 30th, and then less than half a degree. The highest temperature recorded was 60.6 degrees on the 2nd, the lowest in the screen 31.7 degrees on the 28th and 30th, and the lowest on the ground 28.9 degrees on the 30th. There was frost on the ground on 4 nights.

There was a period of high barometer on the 14th till the 22nd, but after the latter date a great fall in the barometer until the 25th when its 9 o'clock reading was 28.727 inches. Almost the whole of the month's rain fell during this period of falling barometer. The total rainfall for the month was 3.329 inches or almost exactly the average for the month; of this amount 2.52 inches fell between the 22nd and 25th.

December. The character of the latter part of 1898 for warm weather was more than sustained in December when the mean temperature was nearly *seven* degrees above the average, being 47·02 degrees as compared with the average value of 40·32 degrees.

The highest temperature recorded was 57·5 degrees on the 5th, and even on the 26th the temperature rose as high as 56 degrees. The lowest air temperature was 29·2 degrees on the 23rd, and the lowest temperature on the ground 28·0 degrees on the same date.

Atmospheric pressure was high with fine weather from the 10th till the 25th, but there were heavy falls of rain in the first and last weeks of the month. The total rainfall amounted to 4·748 inches as compared with the average of 17 Decembers of 3·282 inches.

Taking the year as a whole it is remarkable as having the highest mean temperature of any year since observations were begun at Clifton College in 1881.

D. RINTOUL.

Rainfall, 1898.

Month.	Rainfall in Inches.	Average of 17 years.	Departure from Average.	No. of days on which .01 inches or more rain fell.
January ...	1·234	2·370	− 1·136	9
February ...	1·845	1·998	− 0·153	17
March ...	1·008	2·204	− 1·196	8
April ...	2·210	2·011	+ 0·199	11
May ...	3·391	1·986	+ 1·405	19
June ...	1·311	2·132	− 0·821	13
July ...	0·665	3·300	− 2·635	3
August ...	3·692	3·212	+ 0·480	15
September ...	1·325	3·134	− 1·809	7
October ...	6·167	3·801	+ 2·366	19
November ...	3·329	3·324	+ 0·005	15
December ...	4·748	3·282	+ 1·466	19
	30·925	32·754	− 1·829	155

DAVID RINTOUL.

Rainfall of 1898.

WEEK. ENDING.	RAIN INCHES.	WEEK ENDING.	RAIN INCHES.
January 8	·683	July 9	nil
„ 15	·006	„ 16	nil
„ 22	·040	„ 23	·260
„ 29	nil	„ 30	·090
February 5	·900	August 6	2·093
„ 12	·210	„ 13	·184
„ 19	·585	„ 20	·635
„ 26	·365	„ 27	·543
March 5	·265	Sept. 3	·237
„ 12	·050	„ 10	nil
„ 19	·755	„ 17	·220
„ 26	·078	„ 24	·220
April 2	·060	October 1	·885
„ 9	·440	„ 8	·020
„ 16	·579	„ 15	·510
„ 23	·055	„ 22	4·320
„ 30	1·136	„ 29	·897
May 7	1·136	Nov. 5	1·040
„ 14	·510	„ 12	·025
„ 21	1 171	„ 19	·020
„ 28	·295	„ 26	2·634
June 4	·195	Dec. 3	·550
„ 11	·250	„ 10	1·990
„ 18	·056	„ 17	·150
„ 25	·700	„ 24	·340
July 2	·475	„ 31	1·748

D. RINTOUL.

Meteorology for the 52 Weeks, ending December 31st, 1898.

Height above Mean Sea Level—250 feet.

1898.	BAROMETRIC PRESSURE at 32° and Sea Level				Mean Temperature	Highest Mean Daily Temperature	Lowest Mean Daily Temperature	Max. Temperature in Shade	Min. Temperature at 4 ft above ground	Min. Temperature on ground	Mean Daily Range of Thermometer	Greatest Daily Range of Thermometer	Smallest Daily Range of Thermometer	Mean Humidity	Grains of Vapour in a cubic ft. of air	Prevalent Wind.
	Inches															
	Mean	Highest	Lowest													
Jan.	8	30·07	30·31	Inches	44·1	48·4	41·15	49·0	34·0	30·8	7·01	15·0	1·1	—	—	S.W.
"	15	30·47	30·69	29·96	42·56	47·40	38·45	50·3	32·4	29·8	7·2	15·8	1·7	87	2·75	S.
"	22	30·46	30·66	30·34	46·84	51·65	37·70	54·5	35·2	34·9	6·5	13·3	1·9	91	3·38	Variable.
"	29	30·58	30·67	30·43	44·74	46·85	42·00	54·0	39·0	34·8	4·3	15·0	1·6	84	2·81	S.
Feb.	5	30·07	30·41	29·37	45·57	51·00	39·35	56·0	31·4	27·8	9·6	15·9	4·9	83	2·96	W.
"	12	30·15	30·34	29·79	44·04	48·80	39·70	52·3	33·2	28·7	9·7	16·7	5·6	87	2·91	W.
"	19	30·15	30·33	29·81	43·71	48·70	35·50	51·5	27·4	25·4	7·2	16·2	—	87	2·94	Variable.
"	26	29·71	30·22	29·16	36·24	41·25	32·85	46·4	28·8	26·9	11·4	15·4	6·1	—	—	N.E.
March	5	29·92	30·08	29·79	40·27	45·00	36·05	49·8	31·1	28·0	9·4	12·1	7·1	82	2·37	N.W.
"	12	30·12	30·30	29·72	36·44	38·90	34·85	44·4	28·7	27·0	10·8	13·8	8·3	88	2·02	—
"	19	30·05	30·16	29·93	46·51	49·85	41·50	52·6	32·0	29·1	9·6	19·0	4·5	81	2·89	W.
"	26	30·06	30·26	29·76	39·86	44·30	34·25	54·3	29·3	26·4	12·8	20·3	6·3	81	2·19	N.E.
April	2	29·67	29·99	29·48	41·71	45·25	38·40	54·3	31·7	28·8	13·8	20·8	7·4	82	2·41	Variable.
"	9	30·08	30·24	29·88	49·21	54·90	42·25	64·5	31·4	28·8	15·3	22·3	8·2	81	3·16	Variable.
"	16	29·86	30·07	29·70	48·9	53·1	45·65	56·1	38·7	35·8	10·1	15·3	4·3	—	—	W.
"	23	30·05	30·24	29·77	48·3	51·7	46·0	59·1	37·1	34·8	17·6	20·1	14·8	—	—	S.E.
"	30	29·81	30·25	29·43	49·38	51·40	47·15	57·8	37·5	35·3	12·6	19·3	6·5	—	—	N.E.
May	7	29·82	30·40	29·51	51·36	54·15	46·60	63·5	42·5	39·0	12·1	21·0	7·2	81	3·41	Variable.
"	14	29·77	30·19	29·33	51·46	54·85	47·90	60·8	40·8	38·9	10·8	16·5	6·2	77	3·34	W'y.
"	21	30·04	30·26	29·75	49·21	52·85	43·75	61·5	38·0	37·1	12·9	17·3	7·0	80	3·21	N.E.
"	28	29·89	30·14	29·78	55·32	61·15	49·15	71·8	45·5	43·9	12·5	21·3	2·3	81	3·47	N.E.
June	4	29·92	30·21	29·69	51·91	54·30	47·80	58·9	43·3	—	8·6	13·5	2·9	78	3·58	W'y.
"	11	30·08	30·26	29·82	60·51	66·45	56·95	75·3	47·5	—	17·4	23·3	14·5	77	4·28	Variable.
"	18	30·32	30·36	30·25	56·52	60·90	52·05	70·3	42·8	—	15·5	24·7	7·1	77	3·74	Variable.
"	25	29·92	30·17	29·48	59·40	63·70	55·25	68·5	49·9	—	10·9	16·1	7·9	73	4·22	W'y.

* For six days : observations omitted on June 12th.

Meteorology for the 52 Weeks—Continued.

Height above Mean Sea Level—250 feet.

1898.	BAROMETRIC PRESSURE at 32° and Sea Level				Mean Temperature	Highest Mean Daily Temperature	Lowest Mean Daily Temperature	Max. Temperature in Shade	Min. Temperature at 4ft above ground	Min. Temperature on ground	Mean Daily Range of Thermometer	Greatest Daily Range of Thermometer	Smallest Daily Range of Thermometer	Mean Humidity	Grains of Vapour in a cubic ft. of air	Prevalent Wind.
	Mean	Highest	Lowest													
Week Ending	Inches	Inches	Inches													
July 2	30.05	30.27	29.56	58.54	63.10	52.05	68.4	43.2	—	15.9	20.9	10.6	4.22	77	4.22	Variable.
" 9	30.27	30.38	30.07	61.02	64.90	55.30	73.3	48.8	—	15.2	18.7	11.6	3.94	67	3.94	Variable.
" 16	30.27	30.44	30.03	63.22	68.90	59.15	78.7	48.5	—	16.8	23.0	8.2	4.32	69	4.32	W'y.
" 23	30.09	30.23	29.86	63.10	66.20	60.6	74.6	52.6	—	11.3	16.8	8.4	—	—	—	S.
" 30	30.17	30.34	30.02	60.16	63.35	57.50	76.10	45.4	—	15.6	24.2	11.9	—	—	—	N.W.
August 6	30.08	30.39	29.83	61.82	64.85	55.75	72.10	50.3	—	13.0	21.1	3.3	—	—	—	W.
" 13	30.03	30.25	29.87	62.16	69.05	54.90	80.60	49.5	—	13.6	23.1	9.2	—	—	—	N.
" 20	30.10	30.20	30.02	66.40	69.20	63.90	77.60	55.3	—	16.1	17.2	13.7	—	—	—	N.
" 27	30.14	30.30	30.01	63.51	70.10	57.55	82.3	52.3	—	12.7	24.4	4.3	—	—	—	S.
Sept. 3	30.26	30.46	29.96	60.9	68.30	56.30	79.50	47.4	—	13.9	22.4	7.5	—	—	—	W.
" 10	30.19	30.48	30.01	71.78	75.85	60.80	86.80	54.0	—	17.4	24.4	5.2	—	—	—	S.W.
" 17	30.19	30.45	30.00	63.54	67.65	58.05	79.8(?)	52.3	—	13.2	26.1	9.7	4.98	75	4.98	W'y.
" 24	30.19	30.32	29.96	57.93	62.40	53.80	69.2	44.3	—	13.1	19.0	5.5	4.26	82	4.26	Variable.
October 1	30.03	30.37	29.76	52.06	55.05	46.60	63.3	41.0	—	13.8	21.9	4.6	3.60	84	3.60	Variable.
" 8	30.24	30.39	30.05	54.17	58.95	47.35	63.5	42.3	34.8	11.2	19.3	3.9	4.29	88	4.29	E., N.E.
" 15	29.89	30.17	29.26	49.54	52.75	45.70	57.6	39.3	36.8	12.1	15.5	8.4	3.41	88	3.41	Ely.
" 22	29.40	29.90	28.84	53.98	58.85	52.15	63.2	46.2	44.9	8.8	13.2	3.7	4.29	92	4.29	S.W.
" 29	30.07	30.16	29.74	55.38	56.75	53.00	60.8	48.0	44.8	6.6	10.0	4.5	4.28	88	4.28	S.W.
Nov. 5	29.79	30.03	29.38	50.37	54.75	48.80	60.6	39.0	36.3	9.6	18.3	3.1	3.39	82	3.39	S.W.
" 12	30.09	30.23	29.83	50.07	51.40	48.30	56.3	41.3	38.7	8.8	14.0	4.8	3.74	94	3.74	E.
" 19	30.29	30.42	29.92	47.90	53.70	43.65	57.1	35.2	35.3	10.0	18.4	2.8	3.34	89	3.34	Variable.
" 26	29.51	30.25	28.72	44.22	48.45	37.15	52.7	32.5	30.3	5.4	8.5	2.0	2.89	89	2.89	S.E.
Dec. 3	29.72	30.06	29.45	43.83	51.40	36.00	55.5	31.7	28.9	10.2	18.9	4.4	2.97	88	2.97	Variable.
" 10	30.00	30.27	29.77	49.91	55.45	46.35	57.5	39.9	37.4	8.1	13.2	2.9	3.43	85	3.43	W.
" 17	30.39	30.54	30.31	48.93	53.20	45.95	55.3	39.3	36.8	7.2	13.3	4.2	3.14	87	3.14	N.W.
" 24	30.41	30.56	30.24	42.06	52.00	36.45	53.9	29.2	28.0	11.5	17.9	3.4	2.58	80	2.58	Variable.
" 31	29.75	30.39	29.49	46.16	52.45	40.40	56.0	31.8	28.7	10.4	17.2	4.5	3.12	86	3.12	S.W.

† Observations omitted on 26th, 27th, 28th, and 29th July.

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K² 3.

(A) TABLE OF DEATHS during the Year 1898, in the Urban Sanitary District of Bristol, classified according to DISEASES, AGES, and LOCALITIES.

Names of Localities adopted for the purpose of these Statistics; public institutions being shown as separate localities. (Columns for Population and Births are in Table B.)	Mortality from all causes, at subjoined ages.							Mortality from subjoined causes, distinguishing Deaths of Children under 5 years of Age.																										
	At all ages.	Under 1 year.	1 and under 5	5 and under 15	15 and under 25	25 and under 65	65 and upwards		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				
									Smallpox.	Scarlatina.	Diphtheria	Membranous Croup.	Fevers.				Typhus.	Enteric or Typhoid	Continued	Relapsing.	Puerperal.	Cholera.	Erysipelas.	Measles.	Whooping Cough.	Diarrhoea and Dysentery.	Rheumatic Fever	Phthisis.	Bronchitis, Pneumonia, and Pleurisy.	Heart Disease.	English Cholera.	Injuries.	All Other Diseases.	TOTAL
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)																										
Saint Mary Redcliff ...	267	67	37	9	15	87	52	Under 5 5 upwds.													19	6	10			18	1		4	46	104			
St. Paul	237	66	45	4	5	67	50	Under 5 5 upwds.			3										21	5	10		2	16		1	53	111				
St. Augustine	295	77	54	9	11	80	64	Under 5 5 upwds.						1				1			32	2	12			15	1	2	65	131				
Bedminster	1012	361	159	23	35	242	192	Under 5 5 upwds.		3	4	3		1						38	29	70		2	76	1		3	290	520				
Clifton	583	99	48	8	20	177	231	Under 5 5 upwds.			1						2	2		1	19	6	6		3	23		3	85	147				
Ashley	433	109	39	25	23	12	112	Under 5 5 upwds.			1									14	6	23			24	2		1	77	148				
St. George	743	288	137	34	29	156	99	Under 5 5 upwds.		1	3	1					1			48	18	91		2	86			4	171	425				
St. Philip	797	276	163	20	20	190	128	Under 5 5 upwds.		1	2									7	1	2	3	46	49	46		9	151	318				
Stapleton	194	61	24	4	6	67	32	Under 5 5 upwds.										1			14	2	21			9		2	37	85				
Royal Infirmary ...	210	21	27	16	32	93	21	Under 5 5 upwds.			4									1		4			6			6	27	48				
General Hospital ...	161	6	16	15	19	94	11	Under 5 5 upwds.			4											1			1				6	10	22			
Children's Hospital ...	80	29	32	15	1	3		Under 5 5 upwds.			4	1								3	1	3			9	1			39	61				
Small Pox Hospital ...	2					2		Under 5 5 upwds.																										
Fever Hospital...	4		3	1				Under 5 5 upwds.		3																								
Stapleton Workhouse ...	119	7	3	2	8	46	53	Under 5 5 upwds.						1					2		1	4			1	9		4	68	109				
Eastville do ...	197	24	8		8	78	79	Under 5 5 upwds.						1							1	3			2		1	25	32					
Long Ashton do ...	36			2	1	14	19	Under 5 5 upwds.																20	20	23		3	97	165				
Lunatic Asylum ...	71				2	51	18	Under 5 5 upwds.																2	9	4			21	36				
TOTALS	5441	1491	795	187	235	1572	1161	Under 5 5 upwds.		8	26	5		2				1	294	108	327		16	386	9		37	1067	2256					
										6	13			24			11	5	15	2	21	6	377	552	463		139	1521	3155					

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(B). Table of Population, Births, and of New CASES of Infectious Sickness, coming to the knowledge of the Medical Officer of Health, during the year 1898, in the Urban Sanitary District of Bristol; classified according to DISEASES, AGES, and LOCALITIES.

Names of Localities adopted for the purpose of these Statistics; Public Institutions being shown as separate localities.	Population at all Ages.		Registered Births	New Cases of Sickness in each locality coming to the knowledge of the Medical Officer of Health.													Number of such Cases Removed from their Homes in the several localities for treatment in Isolation Hospital																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Census, 1891. (b)	Estimated to middle of 1898.		Aged under 5 or over 5. (d)	1	2	3	4	5	6	7	8	9	10	11	12	13	1	2	3	4	5	6	7	8	9	10	11	12	13																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
					Small Pox.	Scarlatina.	Diphtheria.	Membranous Croup.	Fevers.					Typhus.	Enteric or Typhoid.	Continued.	Relapsing.	Puerperal.	Cholera.	Erysipelas.	Small Pox.	Scarlatina.	Diphtheria.	Membranous Croup.	Fevers.					Typhus.	Enteric or Typhoid.	Continued.	Relapsing.	Puerperal.	Cholera.	Erysipelas.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Notification of Infectious Disease has been compulsory in Bristol since February 12th, 1890. Only those Diseases Scheduled in the Act are at present Notifiable. The Isolation Hospitals used by the Sick of the District are:—

NAME OF HOSPITAL.	DISEASES ISOLATED.	DISTRICT WHERE SITUATED.
1.—Sanitary Authority's Hospital ...	Small Pox or Scarlet Fever ...	Novers Hill, Bedminster.
2.—Bristol Guardians' Hospital ...	Small Pox, Fever, Erysipelas ...	Stapleton, outside City.
3.—Stapleton Fever Hospital ...	Fevers ...	Lent to Guardians.
4.—Children's Hospital ...	Scarlet Fever, Erysipelas ...	St. Augustine, Bristol.
5.—Bristol General Hospital ..	Enteric Fever ...	Partly in St. Mary Redcliff, and partly in Bedminster.
6.—Royal Infirmary ...	Ditto ...	St. James, Bristol.
7.—Clift House (temporary) ...	Scarlet Fever, Diphtheria, Fever ...	Bedminster, Bristol.

Diphtheria is, as a rule, only admitted into Public Institutions in cases where operation is necessary.

* Since 1891, both before and after the Extension Act, 1897, many alterations have taken place in the area of these Districts, some being enlarged, others reduced, and in some cases a portion of one District added to another, so that these populations cannot be given except approximately. For particulars of these alterations see Table A on page 6.

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